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THE NEXT ANNUAL MEETING OF THE MASSACHUSETTS MEDICAL SOCIETY WILL BE HELD AT THE NEW OCEAN HOUSE, SWAMPSCOTT, FRIDAY AND SATURDAY, JUNE 6 AND 7, 1924

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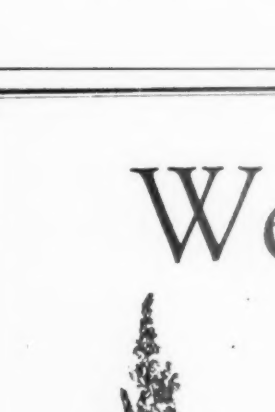
Weed Hay Fever



THE Late Summer and Early Autumn Type of Hay Fever is caused by many of the common weeds, as–Ragweed, Russian Thistle, Sage Brush –the species differing widely according to locality. To assure specific treatment diagnostic tests are essential. To assure preseasonal treatment early diagnoses should be made,–otherwise the less desirable, though often beneficial, coseasonal treatment will be involved. List of late flowering weeds, showing regional distribution and time of pollination, sent on request.

GIANT RAGWEED Ambrosia trifida

RUSSIAN THISTLE Salsola pestifer

SAGE BRUSH Artemisia tridentata

The Arlington Chemical Company

Yonkers, New York

THE BOSTON
Medical and Surgical
JOURNAL

VOLUME 190 MAY 15, 1924 NUMBER 20

ORIGINAL ARTICLES

A Study of the Isolation and Concentration of the Specific Antibodies of Antipneumococcus Sera*

BY LLOYD D. FELTON

[From the Department of Preventive Medicine and Hygiene, Harvard Medical School, Boston.]

STUDIES on virulence published[1] and since carried out have demonstrated the possibility of increasing or decreasing the virulence of pneumococci for mice by an *in vitro* method. As an outgrowth of these studies on the analysis of conditions and food supply which cause these alterations in biological activity, the influence of normal horse serum and serum from a horse immunized against pneumococci was determined. A significant difference in the action of the two sera was noted. The normal serum, on the one hand, furnished conditions in which the virulence of pneumococci remained constant for a considerable length of time, while immune serum, on the other hand, caused a very rapid decrease in virulence. That is to say, under the same conditions of growth in which appropriate medium caused an increase in virulence, normal serum used as medium was capable of maintaining this activity, though a gradual decrease finally occurred; conversely, the use of immune instead of normal serum resulted in a precipitous fall in virulence. In the main, these results are confirmatory of those obtained by Stryker,[2] who used ordinary transfer methods. Details of these experiments will appear in another publication.

The remarkable difference in the behavior of normal and immune sera under optimum conditions of growth in rate of alteration of the virulence of pneumococci caused us to pause in our analysis of growth conditions and to endeavor an isolation of the substance which is so pronouncedly antagonistic to virulence. Because of the large amount of serum needed for an analysis of the activity of the various fractions of immune serum, recourse was made to mouse protection tests, believing that the substance in immune serum which protects and the substance which causes the decrease in virulence are one and the same: indications of such fact have since been found

For the sake of orientation into which fraction of serum contained the protective substance, three types of experiments were carried out,—dialysis against distilled water, endosomosis through a celloidin membrane and electrical migration. The results of these preliminary experiments all indicated that the protective substance was at least associated with the water insoluble fraction of serum—the globulin. However, in none of the many studies made did a method suggest itself which would be applicable to lots of serum sufficiently large for the purpose at hand. So that, since the protective action of immune sera was found to be associated with or were globulin, the usual methods for preparing these were used, choosing first precipitation by carbon dioxid in diluted serum.

Protective power was found in globulins prepared by the carbon dioxid method, but the yield in protective substance was never more than half (generally much less) as great as the original serum from which it had been precipitated. While making these studies with carbon dioxid precipitant, it was observed that a very heavy precipitate was formed in antipneumococcus serum when simply diluted 1-10 in water; in fact, the amount thus obtained was greater than that precipitated by the carbon dioxid method. Table I represents an experiment to show the relative amount of protective substance obtained by precipitation with carbon dioxid and simply on dilution with water. This experiment represents one of many, all of which gave similar results. It is evident from this experiment that the carbon dioxid method precipitated but one-half as much as the original serum, while the dilution method precipitated two to four times as much. Undoubtedly, the variation in the amount of precipitate obtained with carbon dioxid and with simple dilution can be attributed to two facts: (1) that the final H-ion concentration of the solution through which carbon dioxid was bubbled is on the acid

*This is one of a series of studies carried out in part under a grant by the Influenza Commission of the Metropolitan Life Insurance Company.

side of the isoelectric point of the protein and consequently a great deal of the precipitate is redissolved; and (2) that the substance is more soluble in the presence of carbonates or as a carbonate.

A COMPARISON OF PROTECTIVE ACTION OF IMMUNE SERA AND PRECIPITATE OBTAINED BY DILUTION

In this experiment, sera from three horses were studied. Serum from horse No. 342 was taken one week after last immunizing injection and at intervals following. Single specimens of serum from horses Nos. 356 and 348 were obtained when the sera showed high protective power. Serum from one normal horse was added as a control. In all specimens 4 cc. of serum was added to 40 cc. of distilled water, and the amount of precipitate judged just after flocculation began. The diluted serum was then centrifugalized and the precipitate taken up in 4 cc. of physiological salt solution and tested for protective power on mice. Table II gives a summary of the experiment. Two significant facts were developed by this experiment: first, that the amount of precipitate appears to indicate the degree of protective power of the serum; and, second, that the precipitable substance disappears from the serum of a horse as the protective power of its serum is lost.

EFFECT OF DILUTION WITH WATER, A COMPARISON WITH TARTARIC ACID

To determine the degree of dilution with water which produced a maximum yield, the experiment in Table II was done. In addition, since preliminary experiments indicated that certain concentrations of acids of low dissociation constants seems to improve the quantity of protein substance obtained, a comparison was made with tartaric acid. The same amount of 1/100th molecular solution of this acid was added to the serum irrespective of dilution. It is seen from the table that dilutions in water of 1-5 or 1-80 are not so efficacious as dilutions 1-10 and 1-20. With tartaric acid, however, the same protective action was obtained from dilutions 1-10, 1-20 and 1-40. The difference between the behavior of the serum diluted 1-40 with water and 1-40 with tartaric acid indicated that the H-ion concentration in one, tartaric acid, is nearer the isoelectric point or zone than is the other, hence a more complete precipitation with tartaric acid in the high dilution of serum.

A repetition of the above experiment was made at a single dilution to determine the relative protective substance obtained by tartaric acid and by water (Table III). The supernatant from each experiment was tested to enable a comparison of the amount of protective substance which remained in the serum. Serum of rather weak protective strength was used. In both cases, 4 cc. of serum was added to 40 cc. of diluent and the mixture allowed to precipitate over night. The supernatant was decanted and the resultant precipitate washed once with an equal volume of water and then dissolved in 2 cc. of physiological salt solution. The results show that the tartaric acid mixture

TABLE I

Protective Action of Globulin Precipitated by Co_2 and by Dilution with Water
A Comparison with the Original Serum

Solution	Dose of Culture	1-10	1-20	1-40	1-80	1-160	1-320
Globulin	0.05 cc.	S	S	36	36	48	36
by Co_2		S	S	36	36	36	36
Globulin	0.05 cc.	S	S	S	S	S	S
by Water		S	S	S	S	S	S
Original	0.05 cc.	S	S	S	S	48	36
Serum		S	S	S	96	36	36
Controls of virulence		.0000001 36	.000001 36	.00001 36	.0001 36		

Nos. refer to hours of duration of life. S = Survived.
10 cc. serum was diluted to 100 cc. with water. Fifty cc. was precipitated with carbon dioxid and 50 cc. allowed to precipitate without carbon dioxid. Precipitate taken up in 5 cc. physiological salt solution.

TABLE II

Protection of Serum and Its Precipitate

Specimen of Serum		Dil. of Serum Protecting 1 Million M. L. D.	Relative Amount of Precipitate.	Protection of Precipitate Dissolved in Vol. of Original Serum.
Horse 342	11/30	1-80	++++	1-160
	12/10	1-40	+++	1-80
	12/17	1-20	++	1-40
	12/31	1-10	+	1-10
	1/14	1-5	+	1-10
	1/21	1-5	+	1-10
Horse 348		1-80	++++	1-320
Horse 356		1-40	++++	1-160
Normal horse		0	++	0

produces a little better yield than water alone. The supernatants, however, are seemingly equal to each other in protective power. This experiment emphasizes a fact which has been quite constant: that is, as judged by the shortness of life following an injection, there is a quality of action in the precipitate obtained by dilution with water antagonistic to the protective strength of the substance. It has been possible to obviate this antagonistic effect by repeated washings in water or m/100 phosphate buffer of H-ion concentration pH=6.6, or by precipitation of the serum in 1/1,000th molecular solution of almost any weak acid with subsequent washings in water. The acids tried which gave the best results are tartaric, citric, oxalic and acetic.

TABLE III

Effect of Dilution on Yield of Protective Substances
Water

Amount of Serum	Amount of Water	Dilution	Dilution Protecting 1 Million M. L. D.	Character of Precipitate
2 cc.	8 cc.	1-5	1-80	Yellowish and mucilaginous
2 cc.	18 cc.	1-10	1-640	White flocculent
2 cc.	38 cc.	1-20	1-640	White flocculent
2 cc.	78 cc.	1-40	1-160	Very fine incomplete flocculation
			Tartaric Acid	
2 cc.	8 cc.*	1-5	1-40	Yellowish brown precipitate
2 cc.	18 cc.*	1-10	1-640	White flocculent
2 cc.	38 cc.*	1-20	1-640	White flocculent
2 cc.	78 cc.*	1-40	1-640	White flocculent

* = Amount of water + 0.2 cc. m/100 tartaric acid.

The two above experiments (Tables I and II), along with others, presented an opportunity of testing the efficacy of a concentrated antibody solution in the treatment of pneumonia. It was decided before going further towards perfecting the technic—such as precipitation at the isoelectric point, studies on purification and also making an inquiry whether or not the substance was a globulin or some chemical combined with it—that it would be best to prepare several large lots of protective substance by the dilution method both with water and with tartaric acid. It is needless to say that safety tests on laboratory animals were carried out and the substance was found to be devoid of any estimable harmful action when injected intraperitoneally, subcutaneously or intravenously. As much as 20 cc. per kilo was injected intravenously in a 2-kilo monkey with no signs of injurious action. Intrameningeally, however, it was found that certain lots caused a sterile meningitis similar to that produced by large doses of normal or immune serum.

CONCENTRATION OF LARGE LOTS OF SERUM

Essentially the same method was used in preparing these lots as with those in Table III. One liter of serum was slowly poured into 15 liters of agitated cool distilled water and the precipitate allowed to settle overnight in the icebox or cold room. The clear supernatant fluid was syphoned off and the flocculent precipitate was washed with the same volume of cool distilled water used for the precipitation; the mixture being well agitated. The suspension was permitted to settle during another 24-hour period. Again the supernatant liquid was syphoned off and the white substance collected by means of a Sharples supercentrifuge. The compact white residue in the bowl of the Sharples was taken out and dissolved in one-half molecular sodium chlorid. If the solution was not clear, clarification was obtained in the Sharples, and it was then passed through a Berkefeld candle. With two of the lots, the substance, after being suspended in wash water, failed to settle. However, on the addition of buffer phosphate pH= 6.6 to make m/500 concentration, a very excellent precipitate occurred in 24 hours or less.

The simple technic was applied to seven different lots of antipneumococcus serum, Type I, with the results shown in Table IV. Precipitation in distilled water produced variable results so far as the protective substance is concerned. It is evident from the sera studied that a concentration was obtained from two to twenty times. Further studies show that the precipitation giving the highest protective value, as might be expected, occurs at a definite H-ion concentration, namely at the isoelectric condition of the substance in question. Sufficient data has not been accumulated upon this part of the work to give details at present. An experiment bearing on this subject will be given below. The degree of concentration here given is not the maximum for these preparations. For solubility in sodium chlorid and physical characters of the solution, which permitted of ready sterilization by passing through a Berkefeld, made dilution necessary. Greater concentration has been obtained by using other solvents than sodium chlorid, such as tartaric acid, by which a concentration of forty times has been made or 1-4000 of 1 cc. protecting a mouse from 1 million M. L. D. of pneumococci. As an indication of the amount of nitrogen in a antibody solution which protects a mouse against 1 million M. L. D. of pneumococci, the results in Table V may be studied. For example, lot No. 2 contains 3.43 mg. of nitrogen per cc.: and a dilution of 1-2000 of this protects a mouse against 1 million M. L. D., consequently the amount of nitrogen in this protective unit is 0.00171 mg.

CHEMICAL TESTS

Studies were made upon each of the products obtained from seven different lots of serum given above (Table V). Nitrogen tests were done by Kjeldahl, Biuret test and Ehrlich reagent (p-dimethylamin benzaldehyd) was used on successive dilutions until the solution gave a negative reaction. The intensity of color given by Ehrlich's diazo reagent was compared to the color obtained by a standard tyrosin solution,

1 mg. to 1 cc. The results of these tests clearly indicate that the precipitated substance has not so far been isolated in pure state.

For the purpose of purification and qualitative tests, a sample of precipitate was washed in water, redissolved in sodium chlorid and reprecipitated five separate times. The resultant product was a white fluffy substance almost entirely insoluble in water, but readily soluble in dilute acid and alkaline and in most neutral salts. This well washed substance gives a positive reaction with all the common protein tests. It contains phosphorus and sulphur. The heat coagulation point when dissolved in sodium chlorid is 70°C. These tests show that the protective substance is classed as a globulin, but it must not be inferred that its protective power is necessarily the entire globulin structure.

TABLE IV

Concentration of Protective Substance

Lot No.	Serum	Diluent	Vol. Serum Cc.	Dil. Serum Protecting 1 Million M. L.D.	Vol. Dissolved Precipitate Cc.	Dil. Precipitate Protecting 1 Million M. L. D.	No. Times Concentrated
II	Horse 342 No Preservative	Water 1-20	2000	1-80	500	1-2000	6
III	Wadsworth Preserved in Chloroform and ether	Water 1-20	5000	1-5	500	1-800	16
IV	White Horse 348 No Preservative	Water 1-20	5000	1-20	2000	1-200	2
V	Park No Preservative	Water 1-20	5000	1-40	2000	1-2000	20
VI	Horse 342 No Preservative	Tartaric M/1000 1-20	5000	1-80	1500	1-400	1½
VII	White Tricresol Preservative	Tartaric M/1000 1-20	5000	1-40	2000	1-1000	10
VIII	White Tricresol Preservative	Tartaric M/1000 1-20	4000	1-40	1500	1-600	56

SENSITIVITY TO HEAT

In this experiment, a solution the dilution of 1-200 cc. of which protected against 1 million M. L. D. was divided into five 5 cc. lots. One lot was kept for control and each of the others was heated for 30 minutes at four different temperatures. 50°C, 60°C, 70°C and 80°C. After heating, the protective value of the different solutions was estimated in dilutions 1-10, 1-50, 1-100, 1-200 and 1-400, duplicate mice being used for each dilution. This experiment is typical of others done when the protective substance is dissolved in sodium chlorid. Heat

TABLE V

Chemical Tests

Lot No.	Dil. Protecting 1 Million M. L. D.	Mg. Nitrogen to 1 cc.	Highest Dil. at which Biuret is Positive	Highest Dil. at which Ehrlich is Positive	Diazo as Compared with Tyrosin Standard
II	1-2000	3.43	1-80	1-80	0.59 mg.
III	1-800	2.94	1-20	1-40	0.66 mg.
IV	1-200	2.59	1-20	1-40	Not done
V	1-1000	2.55	1-20	1-80	0.61 mg.
VI	1-400	2.41	1-20	1-80	0.55 mg.
VII	1-1000	4.41	1-40	1-80	0.56 mg.
VIII	1-600	4.13	1-40	1-80	0.52 mg.

destroys the protective power of this substance, the higher the temperature the more rapid this change.

TABLE VI

Effect of Temperature on Protective Power

Temperature for 30 Minutes	Not Heated	50°	60°	70°	80°
Dil. which Protected against 1 million M. L. D.	1-200	1-100	1-50	1-10	0

Coagulation occurred at 70° and 80°. Substance dissolved in m/2 sodium chlorid.

TYPE SPECIFICITY

The question naturally arose: is a protective substance of such high titer specific for one type of pneumococci, or will members of organisms of different types also be influenced? Our first step was the study of different strains of Type I (Table VIII), with the result that all of the 10 strains of this type responded to the action of the same lot of antibody solution as employed with the Type I organisms, six strains of Type II and eleven strains of Type III pneumococci were tested. Two-tenths cc. of undiluted antibody solution was used in the protective test with varying doses of organisms as estimated from dilutions of the culture in a logarithmic series. The results (Table VII) indicate that there is some cross protection with this single lot of antibody solution. The degree of protection is slight when compared to its effect on Type I organisms, and it is only present in some of the strains tested.

MECHANISM OF ACTION

Preliminary work has been done in view of a possible explanation of the method of action of the antibody solution. These queries were taken up:—(1) Is the substance bactericidal in whole blood? (2) Are virulent pneumococci phygocyt-

TABLE VII

Protection for Mice Against Different Strains of Types II, III and IV

Strain	Type	Dose of Lot 2 Solution	Dilution of Organism 1-10	1-100	1-1,000	1-10,000	1-100,000	1-1,000,000	Control 1-1,000,000
A 361	II	0.2	+	+	+	+	+	+	0
A 112	II	0.2	0	+	+	+	+	+	0
A 89	II	0.2	0	0	0	0	0	+	0
A 71	II	0.2	0	+	+	+	+	+	0
A 73	II	0.2	0	0	0	0	+	+	0
A 88	II	0.2	0	0	0	0	0	0	0
A 28	III	0.2	0	0	0	0	0	0	0
A 359	III	0.2	0	0	0	0	0	0	0
A 107	III	0.2	0	0	0	0	0	0	0
M 13	III	0.2	0	0	0	0	0	0	0
C 1	III	0.2	0	0	0	0	0	0	0
A 392	III	0.2	0	0	0	0	0	0	0
B 117	III	0.2	0	0	+	+	+	+	0
A 102	III	0.2	0	0	0	0	0	0	0
A 64	III	0.2	0	0	0	0	0	0	0
A 94	III	0.2	0	+	+	+	+	+	0
A 44	III	0.2	0	+	0	0	+	+	0
A 70	IV	0.2	0	0	0	0	+	+	0
A 66	IV	0.2	0	+	+	+	+	+	0
A 94	IV	0.2	0	0	0	+	+	+	0

+ indicates protection

the antibody solution, but varied greatly in their resistance to its activity. This was true although there was no measurable difference in virulence of the various strains for mice, all of the controls dying in 36 hours with a dose of 0.000,000,1 cc. of an 18-hour serum broth culture.

Preliminary tests with some strains of Types II and III revealed indications of protection of these types by a highly protective substance prepared from Type I serum. This protection, however, seemed very slight. In extending the study to a few more strains and making use of

ized *in vivo* and *in vitro*? (3) Does the solution cause a decrease in virulence of pneumococci? The answer to the first question must be indefinite for the present. In testing ten different lots of concentrated solution, there was found a marked retardation in growth by all specimens and bactericidal action in some, with seemingly no parallelism between this action and protective titer. The second query can be answered definitely in the positive both for *in vivo* and *in vitro* tests. Details of the work will be published later. However, it may be said that all the strains of Type I reported above (Table

VIII) were tested with the antibody solution. Both organism and antibody were injected simultaneously into the peritoneal cavity of mice and exudate withdrawn at intervals from 15 minutes to 6 hours for study. Phagocytosis was found to be abundant in the first withdrawals. Little or none was seen in mice injected with pneumococci alone.

The final question of the three, the answer to which, after all, is the goal toward which these studies were directed, can now be answered in the affirmative. Although sufficient material is not available at present to make use of the automatic transfer device, daily transfers were made in whole blood to which varying concentrations of the antibody solution had been added. Results, without exception, show that the virulent pneumococci lose this virulence more rapidly in the presence of the antibody solution than when grown on whole normal horse blood.

TABLE VIII

Protection in Mice Against Different Strains of Type I
Dose of Organism 0.5 *cc. of* 1-10 *Serum Broth Culture*

Strain	Type	Dilution Protecting 1 Million M. L. D. Lot No. 2								
		0.5 cc. Undiluted	1-10	1-50	1-100	1-200	1-400	1-800	1-1600	1-3200
Neufeld	1	+	+	+	+	+	+	+	0	0
A 117	1	+	+	+	+	+	+	0	0	0
A 303	1	+	+	+	+	+	+	0	0	0
A 360	1	+	+	+	+	+	0	0	0	0
A 368	1	+	+	+	+	+	0	0	0	0
A 349	1	+	+	+	+	+	0	0	0	0
A 381	1	+	+	+	+	+	+	+	+	0
A 72	1	+	+	+	+	+	+	+	0	0
A 69	1	+	+	+	+	+	+	+	+	0
B 125	1	+	+	+	0	0	0	0	0	0

+ indicates protection

EXPLANATION OF UNITS

The use of 0.1 cc. of a virulent pneumococcus culture for protective tests has given irregular results, mice so injected not dying in regular sequence. To obviate this, several experiments were conducted with varying amounts of culture in typical protection tests to see what dilution was most suitable for obtaining reproducible results. The largest dependable dose was found to be 0.5 cc. of a 1-10 dilution of an 18-hour broth culture of such virulence that 0.000,000, 1 cc. kills a mouse in 36 to 48 hours. Accordingly, this number of organisms have been used as a constant dose in our work. I define a unit of antibody solution as that dilution of solution, 0.5 cc. of which will protect a mouse against the dose of organisms mentioned above. That is, if 0.5 cc. of a 1-500 dilution of a given lot of antibody solution protects mice against 0.5 cc. of a 1-10 dilution of a highly virulent pneumococcus, then each cubic centimeter of solution contains 500 units. If the doses of organisms and antibody are increased to 1 cc. instead of 0.5 cc., then the M. L. D. of organisms used would be 1 million. For this reason, we assign the value of the number of organisms used in the described units as 1 million M. L. D. In estimating the protective power of a concentrated solution, duplicate mice are injected with 0.5 cc. of culture and 0.5 cc. of these different dilutions of antibody, namely, 1-10, 1-50, 1-100, 1-200, 1-400, 1-800, 1-1600 and 1-3200. Then, should the mice injected with 1-800, for example, and higher dilutions die, a second titration is made with dilutions such as 1-400, 1-500, 1-600 and 1-800. All surviving mice are kept for 30 days. However, generally, the mice which remain alive for 5 days continue to do so through the 30-day period.

PREPARATION OF ANTIBODY FROM TYPES II AND III SERA

Practically all efforts in this study have been limited to Type I serum of high potency. However, a sufficient number of experiments have been made on Types II and III sera to show definitely that the antibody solution can be prepared from them. The main difficulty has been in obtaining immune sera for these two types of sufficiently high protective power to make experimentation feasible. The obstacle in part has been overcome by first dialyzing the serum to reduce the inorganic content and subsequently diluting the dialyzed material in a dilute phosphate buffer. The success with any of the types is commensurable with the degree of immunity obtained in the horse or the amount of antibody in serum. It is not improbable that, since we have a definite substance for which to seek, modification can be made in our methods of immunization that will enable the preparation of the antibody for one type just as easily as for another.

In addition to pneumococci, as a matter of control, it has been found possible to isolate the

protective substance in immune sera developed by other microorganisms. There are indications that the protective antibody of the pneumococcus is one of many which act in a similar fashion, and its behavior represents a general law for certain groups of bacteria.

SOLUBILITY IN M/100 PHOSPHATE BUFFERS OF DIFFERENT PH VALUES

A preliminary experiment on the solubility of the protective substance in phosphate buffers was made. The substance for this study was obtained by precipitation of a highly protective serum (Type I) in distilled water 1-20. This precipitate was washed twice in distilled water and the concentrated suspension was divided into 10 equal portions (10 cc.). One portion was kept as a control, this portion being dissolved by sodium chlorid crystals so as to maintain an equal volume. One other portion was washed with water and the remaining 8 in m/100 phosphate buffer of different H-ion concentrations. Washing was done each time in a shaking machine for 3 hours in 40 cc. of the respective washing fluids. At the end of this period, the suspension was thrown down in a centrifuge and the supernatant kept for study. The process was repeated five times, making the number of washings of this sample seven in all. The final precipitate was dissolved in 10 cc. of physiological salt solution and protective tests made and nitrogen determinations run. The same procedure was carried out with the final supernatant liquid of the seventh washing. The results are shown in Table IX. Protection tests were done twice and also in duplicate.

Certain inferences may be drawn from the results of this experiment:—(1) The protective substance is relatively insoluble in phosphate buffers of m/100, the solubility varying with the H-ion concentration. (2) The protective substance is least soluble in a pH range from 6.6 to 7.5 and within that range, in this single experiment, apparently there is no correlation between protective potency and the quantity of nitrogen found per cubic centimeter. (3) If a minimum of nitrogen with high protective strength is used as a criterion, the isoelectric condition of this antibody lies around pH 6.8. If, on the other hand, the minimum protective action in the seventh washing is made an issue in determining the isoelectric condition, then a pH of 6.6 is near the isoelectric point. At best, we may say that in the present state of purity, the isoelectric zone of this antibody solution lies somewhere between 6.6 and 7.5.

TABLE IX
Solubility of Antibody Solution in Water and in Phosphates

Washing Fluid	Dil. Protecting Duplicate Mice 1 Million M. L. D.	Dil. 7th Washing Protecting 1 Million M. L. D.	Nitrogen in Dissolved Precipitate Average of 4 Dil.	Nitrogen in 7th Washing
pH 4.75	1-80	1-20	.284	.192 .180
pH 5.75	1-160	1-10	.761	.032 .018
pH 6.0	1-160	0.5 strength = 0	.730	.052 .044
pH 6.6	1-320	0.5 strength = 0	.602	.061 .071
pH 6.8	1-320	1-10	.481	± ±
pH 7.55	1-320	1-10	.541	± ±
pH 7.89	1-160	1-10	.510	.032 .039
pH 8.9	1-160	1-20	.451	.297 .254
Water	1-160	1-10	.771	.028 .038
Original Precipitate	1-320		.892	

CLINICAL APPLICATION

It would be inopportune now to enter upon the details of the clinical studies on human cases of pneumonia. More than 60 cases of this disease have been treated at the Boston City Hospital with encouraging results. Before the final word can be said, however, concerning the usefulness and also the limitations of this agent, much scientific work must be done and the experience of clinicians in different places at all seasons of the year must be collected and studied.

ACKNOWLEDGMENTS

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REFERENCES

1 Felton, L. D., and Dougherty, K. M.: J. Exp. Med., 1924, xxxix, 137; 155.
2 Stryker, L. A.: J. Exp. Med., 1916, xxiv, 49.

DISEASES OF ADULTS WHICH UNNECESSARILY SHORTEN LIFE

DURING 1923 the principal causes of death in Brookline were:

*Diseases of the heart	112
*Cerebral hemorrhage (apoplexy)	57
Cancer	56
Pneumonia and influenza	44
*Diseases of arteries	26
*Diseases of the kidneys	22
Diabetes	16
Tuberculosis (all forms)	10
	343
All other causes	127
Total deaths, 1923	470

* "Wear and tear diseases."

—*Brookline Board of Health Bulletin.*

AMERICAN RED CROSS

Sixteen new nurses were added to the nursing service of the Washington, D. C., division of the American Red Cross in January—*The Nation's Health.*

Acute Pyogenic Parotitis In Otherwise Healthy Individuals

BY ROY G. SPURLING, M. D.
AND
FRED W. STEWART, PH.D.

With Notes on a Simple Method of Diagnosis of Parotitis*

Acute pyogenic parotitis is rarely encountered except in debilitated states. As a post-operative complication, as an accompaniment of acute generalized infection, as a sequel to direct extension from neighboring foci of suppuration, and as a disease of infants, it is not uncommon. That pyogenic parotitis may occur in otherwise normal individuals is undoubted and seems little known; the four cases of this disease which we present may be of interest. Catheterization of Stenson's duct has been employed in the past in the course of experimental work on parotitis. Few reports of its use as a means of clinical diagnosis have come under our observation, and these in the French literature alone. We therefore wish to draw attention to this simple procedure, which has proven of value to us as a means of differential diagnosis.

No mention of acute pyogenic parotitis occurring in otherwise healthy individuals is to be found in our new systems of Medicine. Thus Howard[1] in the Nelson's Loose-Leaf System classifies parotitis as epidemic and symptomatic or secondary. The condition escapes mention in Tice[2] and in the Oxford System of Medicine[3] Eustace Smith[4] in Allbutt and Rolleston's System states that non-specific parotitis (parotid bubo) always occurs as a secondary disease, as a complication of many forms of acute illness. The classification in Osler's Modern Medicine[5] is that of epidemic and secondary. F. Kraus[6] in Nothnagel's Pathology summarizes non-specific parotitis as "metastatic" and as the sequel of neighboring foci of infection. Primary suppurative conditions of the parotid gland find no mention in Keen's Textbook of Surgery[7], the Oxford Surgery[8], or in Ochsner's[9]. European writers, however, recognize clearly a primary suppurative parotitis. Thus in the excellent Nouveau Traité de Médicine of Roger, Widal and Teissier, Parmentier and Chabrol[10] inform us that non-epidemic parotitis is seldom encountered except in marked stomatitis, with calculus, or in the debilitated. Similarly H. Heineke[11] in Deutsche Chirurgie admits the rare occurrence of the condition in otherwise healthy adults and von Mikuliez and Kümmel[12] state "that without evident general septic conditions, and in the absence of demonstrable cause, both in adults and children, occasional salivary gland infections occur." In addition there are isolated case reports in both British and American literature, e. g., Carr[13], Day[14], Jeffries[15], Blair[16].

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Recently Honigman[17] has summarized four personally observed cases of "primary acute suppurative parotitis." In reviewing his report, however, it does not appear quite certain how we are to regard these cases. His first patient on the third day following operation developed "painful swellings of the wrist and finger joints of the right hand" suggestive, of course, of a more generalized septic condition; the second case was a diabetic who developed an otitis media, or at least discharged pus from the external auditory meatus of the side involved, and who had, before operation, been attending the ear clinic for reasons not stated; the third patient suffered from "myalgia of the opposite side of the neck and opposite pectoral muscles" and during convalescence developed signs of cholecystitis and pleuritis; the fourth case had a discharging ear, and in addition there had been a phlegmonous angina two weeks before the onset of the parotitis. In view of the intimate relation of lymph nodes of the parotid gland to the middle ear, and of the common occurrence of otitis media, the "primary" nature of parotitis accompanied by purulent discharge from the external auditory meatus must remain doubtful.

REVIEW OF CASES

In reviewing the records of this hospital for the last five years, we found twenty-two cases of suppurative parotitis, seven of which had occurred during the past three months (Table I). Of these twenty-two cases, five followed surgical operations, and four of the five occurred after operations for septic conditions in the abdominal cavity. Ten cases appeared in debilitated individuals who were suffering from acute or chronic infections or malnutrition from some wasting disease. Two cases apparently followed acute otitis media. When one considers that the anterior auricular lymph node, which lies just above the parotid, drains a part of the middle ear and external auditory canal, it becomes obvious that this is a possible pathway for the spread of infection from that region to the vicinity of the parotid gland.

Direct trauma apparently initiated the process in the parotid gland in one instance. This patient, twelve months previous to his entrance to the hospital, developed an acute swelling of the left parotid region a few hours after a blow over the left side of the face. There was no open wound of the part. The tumor was red, hot and tender to pressure. He had definite chills and fever. He noticed a strange metallic taste in his mouth for two or three days during which

the tumor was at its height. He was treated with hot and cold applications and the inflammation subsided spontaneously in eight to ten days though some degree of swelling persisted. During the following year, the patient experienced several exacerbations of the swelling which were attended only with symptoms referble to the mechanical opening of the mouth. The part was never tender, hot or red after the initial attack. He had neither fever nor malaise. The left cheek had been getting progressively larger during the three months previous to entrance to the hospital and had failed to recede to its normal size following an exacerbation of swelling. When seen on the surgical service, thirteen months following the primary attack, his condition was thought to be a mixed tumor of the parotid, with possibly some cystic degeneration, and the gland was incised. There was no evidence of a mixed tumor, however, and a rather large mass of chronic inflammatory tissue, confirmed by miscroscopical examination, involving the anterior part of the gland, was removed. In this case, the only obvious precipitating cause for the chronic inflammation of the gland was trauma, as the patient had always been in excellent health before the accident. Just what the mechanism of infection was in this case is problematical.

Four of the twenty-two cases of this series may be classed as "idiopathic"; three of these have been observed during the past two months. The term "idiopathic" simply admits our ignorance of the true etiology of the condition; however, in the cases we have observed, no definite history of predisposing factors could be elicited, even by the most careful questioning. Every one of the four patients had been in good health up to the time of the first symptom of swelling in the parotid region. In all instances the lesion was unilateral. A brief abstract of these four cases is given below:

CASE I. T. M. K., age 16, Surg. No. 19975, entered this hospital complaining of "swelling of the jaw." F. H. and P. H. were negative. He had had bi-lateral mumps in childhood. He had enjoyed excellent health until the P. I. Three days prior to admission, he noticed a swelling at angle of left lower jaw. This was painful to touch and caused difficulty in opening the mouth. It gradually increased during the next forty-eight hours but, with the application of ice bags, it became less painful and somewhat less swollen during the next two days. He experienced no chills or fever. The P. E. was negative except for several carious teeth and a firm, warm, tender, non-fluctuant swelling involving the entire left parotid region. The orifice of the parotid duct was reddened, swollen and gapping. No secretion could be expressed from the duct but a cannula was easily passed into the ampulla and a small amount of cloudy liquid withdrawn. Microscopic examination showed abundance of polymorphonuclear leucocytes and short-chain cocci. Temp. 100.2°F. W. B. C. 14,800. As there was no fluctuation over the part he was treated with cold applications. The swelling disappeared rapidly, and on the fifth day after admission, the patient was discharged in good condition.

The etiology is obscure in this case unless one considers the teeth to be the cause of the trouble.

CASE II. J. E. F., age 75, Surg. No. 19951, entered the hospital complaining of pain in right side of face. The F. H. and P. H. were irrelevant. Five months ago, the patient noted tenderness over right side of face, but there was no swelling nor other sign of inflammation, nor was there pain in the ear or around the teeth. Six weeks ago his right cheek felt stiff and he had difficulty in opening his mouth, although he noticed no swelling. Two weeks ago he first observed fullness of the right side of face associated with continuous dull aching pain. The enlargement gradually increased until the eye became almost closed. The P. E. showed a warm reddened, firm tumor occupying the anatomical limits of the parotid with areas of definite fluctuation. Stenson's duct could not be examined due to inability of patient to open his mouth. Admission temperature was 101°F. W. B. C. 20,800. His condition was such that prompt operation seemed advisable. The tumor was opened by an incision (described later) and a large quantity of rather thick yellow pus was evacuated. Culture showed streptococci. The abscess apparently involved the whole parotid gland. Carrel-Dakin tubes and one gutta percha drain were inserted. He had an uneventful convalescence, except for a salivary fistula which persisted for three weeks and finally closed spontaneously. X-rays of the teeth showed an unerupted third lower molar tooth on each side around which there was evidence of bone destruction. There were, however, no symptoms referable to these teeth.

In this case one may scarcely suppose the unerupted molar teeth to have been the predisposing cause of the parotitis. The lymphatic drainage of the lower teeth is not towards the parotid region and a direct extension cannot be explained on an anatomical basis.

CASE III. M. E. M., age 33, Surg. No. 20203, entered the hospital with symptoms suggestive of cholelithiasis and cholecystitis. She was operated upon for this condition and in addition to a chronic cholecystitis with stones, a small liver abscess was encountered. She made an uneventful recovery, and was up and about the ward, feeling well, when she developed an acute swelling in the region of the left parotid gland. The patient stated that six months previously, a similar swelling appeared in the same location without any precipitating cause to the best of her knowledge. The initial swelling was hot, tender to pressure and caused her considerable difficulty in opening her mouth. She noticed a peculiar taste in her mouth at this time. The tumor gradually subsided, on treatment with ice bags and cold packs, only to reappear again after two or three weeks. It never caused her sufficient discomfort to induce her to enter the hospital. Her local physician was consulted and told her she had "recurrent mumps." However, she stated that she had had mumps in childhood. This sequence of events recurred four times until the attack as described above was observed in this hospital.

The P. E. showed a swelling of moderate size, involving the whole left parotid region which was firm, smooth and somewhat warm. There was no redness or fluctuation. The mouth of Stenson's duct was reddened and elevated. Pus could easily be expressed. The mouth of the duct was carefully prepared with alcohol, bichloride and boric acid solution and a sterile glass cannula inserted into the duct and pus removed for culture. This showed a pure culture of streptococcus viridans. The temperature was normal except for one reading of 99°F. W. B. C. 8,000. The swelling gradually disappeared

Name	Age	Side Affected	Predisposing Factors	Organism from Parotid Abscess	W.B.C.	Temp	Treatment.	Result
T.M.K.	16	left	Idiopathic	Short chain cocci	14,800	100.2°	Expectant	well
J.E.F.	76	right	Idiopathic	Streptococcus	20,800	101°	Through and through drainage with Carroll-Dakin irrigation.	well
M.E.M.	33	left	Idiopathic	Streptococcus Viridans	8,000	99°	Expectant	improved
W.G.	66	right	Idiopathic	Unknown	18,000	101°	Expectant	well (after 2 yrs.)
M.F.	42	right	Chronic peptic ulcers. Long history of furunculosis.	Streptococcus	16,000	104°	Through and through drainage with Carroll-Dakin irrigation.	well
B.U.	57	left	Perforated gastric ulcer. Streptococcus peritonitis.	Unknown	8,500	100°	Expectant	dead
J.G.B.	21	bilateral	Streptococcus peritonitis with operation	Unknown	7,800	101°	Expectant	well
H.S.	44	left	staphlococcus infection of the spleen	Unknown	15,800	101.8°	Expectant	well
G.F.C.	65	bilateral	diarrhoea and weakness. General debility	Staphlococcus aureus.	17,800	100°	Through and through drainage with Carroll-Dakin irrigation.	dead
J.H.S.	65	bilateral	Hypertrophy of prostate with cystitis. Post operative.	Streptococcus	11,600	102°	Expectant	dead
M.W.	56	left	Intestinal obstruction. Post operative	Staphlococcus aureus.	16,000	102°	Single incision and packing; later Carroll-Dakin irrigation started	dead
B.P.	59	right	Post operative. No sepsis	Unknown	17,200	102°	Expectant	well
M.A.C.	34	right	Otitis media and infection of the external auditory canal	Unknown	34,000	101°	Through and through drainage	well
F.O.M.	23	right	Sore throat and rhinitis for 8 days	Unknown	16,800	102°	Expectant	well
F.H.	51	right	Otitis media and ulcerated tooth	Unknown	11,000	100.8°	Expectant	well
S.M.	75	right	Bronchopneumonia	Unknown	18,000	102°	Expectant	dead
C.M.T.	19	bilateral	Meningitis (?)	Unknown	10,000	100.4°	Expectant	well
D.C.W.	16	left	Trauma to left face	Unknown	1,500	99°	Expectant treatment during first four attacks. Complete excision of gland during fifth attack.	well
D.P.	24	right	Nephritis and myocarditis. General debility	Unknown	12,000	100°	Expectant	dead
S.P.	20	left	Post partum psychosis with questionable uterine sepsis	Staphlococcus aureus.	24,000	104°	Single incision with Carroll-Dakin irrigation.	well
T.H.	39	left	Empyema and general debility	Staphlococcus aureus.	113,000*	101°	Expectant	dead
L.F.	32	right	Nephritis and uremia	Staphlococcus aureus.	30,400	101°	Expectant	dead

TABLE I

* 95% Polymorphonucleare.

and the patient was discharged improved and feeling well.

This represents a case of recurrent septic parotitis of which the etiology is obscure, although there is an antecedent history of gall stone attacks. The fact that a liver abscess was encountered at operation may appear significant. It is, however, extremely unlikely that the abscess was present at the time of her first attack of parotitis six months previously. Moreover the fact that the liver abscess had completely healed before the last attack appeared, is strong presumptive evidence that it was not the predisposing factor in this case. The first attack of swelling appeared while she was on a vacation and during a time when she was enjoying excellent health.

CASE IV. W. G., age 66, Surg. No. 15481. F. H. unimportant. P. H. negative except for a swelling of the left side of face many years before, caused by an "ulcerated tooth." P. I. Three weeks before admission to the hospital, he noticed a small oval swelling which was located just in front of the right ear. The tumor was painful and caused difficulty in opening the mouth. It gradually increased in size until it involved the whole region of the parotid gland. There was no local heat or redness. P. E. was negative except for a diffuse hard swelling involving the region of the right parotid. It was tender to pressure, but was not reddened or hot. The opening of Stenson's duct was apparently not examined. W. B. C. 18,000. Temp. 100-101°F. The swelling gradually subsided while under observation in the hospital, and he was discharged, on the 17th day following admission, cured. A letter from his local doctor two years later stated that the patient had been entirely well since his discharge, and had noticed no further swelling of the face.

At the time the patient was seen there was considerable doubt among the staff as to whether the tumor was due to a neoplasm or to an infection of the gland. The subsequent course of the disease made certain the diagnosis of infection of the parotid. Undoubtedly had the parotid duct been examined, and perhaps catheterized, the true nature of the condition would have been recognized at once. The etiology of the septic parotitis in this instance is quite obscure; the teeth cannot possibly be blamed as they were all extracted five years previous to the development of the parotitis. The mouth, however, was poorly kept and the tongue coated.

DIAGNOSIS

Given a case of swelling in the parotid region, the question of differential diagnosis at once arises. Is it a suppurative parotitis, mumps, lymphadenitis, cellulitis of the face, or a neoplasm? Mistaken diagnoses of lymphadenitis or cellulitis are probably not infrequent. The parotid neoplasms are readily diagnosed from the history and the physical examination and hence need not be further considered. Chronic inflammatory swellings of this region are usually multiple and rarely cause confusion. The simplest method of differentiating pyogenic from non-pyogenic parotitis or from any of the other conditions, noted above, is to catheterize the parotid duct, in order to secure material for culture and a microscopical examination. It is this simple procedure which we wish to emphasize, for it is one which apparently has been little used outside of experimental work.

Let us suppose that we secure a positive culture,—how significant is it? Gilbert and Lippman[18] found that the parotid ducts of dogs were never sterile. By dissecting out the duct and making cultures from proximal, middle, and distal thirds they were able to grow, under aerobic and anaerobic conditions, a great variety of organisms. Claisse and Dupré[19] and Galippe[20] made similar observations shortly after death upon young infants, young cats and guinea-pigs, and in man. It is, therefore, apparent that a positive culture obtained from the parotid duct is not an infallible sign of pyogenic parotitis; but a pure culture, as of streptococcus viridans, especially if repeated, is undoubtedly of great diagnostic value, particularly when the material for culture is obtained free from contamination by mouth organisms. The presence of pus cells in the catheter specimen from Stenson's duct, we consider to be almost pathognomic of infection of the parotid gland. Parotid neoplasms may become infected, hence the catheter specimen must be interpreted in the full light of the clinical history of the case. Some observers, Sicard and Dopter[21] claim that polymorphonuclear leucocytes, lymphocytes and large mononuclear cells are to be found in the parotid secretion in mumps; these authors examined catheter specimens of saliva after pilocarpine stimulation in fifty-two cases of mumps. Fourteen years later De la Prade and Loiret[22] examined by catheterization, forty-eight cases of sub-maxillary mumps and forty-six of parotid mumps. They reached the conclusion,—one which is now generally accepted—that the secretion collected from the duct in epidemic parotitis (mumps) does not differ from the normal secretion; they were fully cognizant of the previous work of Sicard and Dopter and were inclined to interpret the latters' findings as the result of pilocarpine stimulation. In nine out of twelve cases where no attempt whatever was made to induce salivation, the secretion contained no cellular elements. It would seem probable that the results of De la Prade and Loiret are to be accepted over those of Sicard and Dopter as reflecting fourteen years of refinement of bacteriological methods.

The technique adopted in our catheterizations is very simple. The catheter consists of an ordinary piece of glass tubing, one end of which is drawn out forming a capillary tube about one millimeter in diameter and some four centimeters in length, the other end being equipped with a rubber aspirating bulb (See Fig. I). It is an apparatus which may be constructed in

five minutes by any practitioner possessing either a piece of glass tubing or an "eye-dropper." The capillary-tube may be readily inserted as far as is deemed necessary in the duct (usually one-half centimeter has been ample to secure pus). The procedure is painless and a mouth-gag has never been required. If necessary, gentle milking of the duct may accompany aspiration. The simplicity of entering the parotid duct is evidenced in Kussmaul's[3] case, where the patient himself was taught to insert a platinum probe for the relief of recurrent fibropurulent duct obstruction.

Fig. I.

TREATMENT

The method of treatment which has been used with the greatest success in this clinic is to refrain from operative procedures until there is definite fluctuation over the tumor mass. Until fluctuation occurs ice bags are applied and the mouth washed out hourly with an alkaline lotion. It is also helpful to swab off the opening of Stenson's duct hourly to prevent crusting and to promote free drainage through the duct. This expectant treatment is often sufficient to effect a cure: nine of the thirteen cases treated in this manner, recovered.

Should fluctuation occur, immediate operation is indicated. The incision is made over the most dependent portion of the fluctuant area, down through the capsule of the gland. After the primary abscess cavity is evacuated the finger is inserted, care being taken to connect any other walled off collections of pus with the primary cavity. A small supplementary incision may rarely be found necessary, if the cavity is large enough to warrant it. Two or three Carrel-Dakin tubes are then inserted. This gives through and through drainage and affords the best opportunity for Dakinizing the wound. Fifteen c.c. of Carrel-Dakin solution are introduced through each tube every hour during the day and night until the discharge has lessened and the wound is clean. The wound is then dressed with vaselinized sterile dressings until healing occurs. The first incision is usually made just below the angle of the mandible in line with the creases of the neck. This exposes the lower pole of the gland and gives the best opportunity for dependent drainage. The secondary incision, when necessary, is usually made just below the zygoma in line with the upper fibers of the facial nerve. Care should be taken when the exploring finger is inserted into the gland not to tear the fibers of the nerve. This can easily be avoided by keeping close to the superficial part of the capsule as the nerve lies quite deeply in this region. There is scarcely any disfiguring following this method of treatment as the lower and more extensive scar lies parallel to, and often concealed in, one of the folds of the skin of the neck. The scar of the upper incision is surprisingly slight and insignificant.

PROGNOSIS

The mortality of suppurative parotitis in this group of patients was thirty-six and one-third per cent (eight died and fourteen recovered). This figure is distinctly misleading, however, as the primary condition in five instances was undoubtedly the immediate cause of death and the parotid abscess was purely a terminal event. Of the four cases of parotitis in otherwise healthy individuals, all recovered. The type of organism does not seem to influence greatly the clinical course of the disease in this series of patients, although there is a suggestion that the patients with streptococcal infection are more likely to make a spontaneous recovery.

DISCUSSION

Septic parotitis is usually found to occur secondarily to general sepsis of some chronic debilitating disease; hence when the condition has arisen in otherwise healthy adults it has been practically disregarded. That it does occur, and perhaps not so infrequently as is generally believed, must be recognized. Perhaps the condition has been disregarded because of the fact that it is usually mild, and spontaneous cure often results. Of the four cases here reported, three subsided spontaneously, while the fourth came to operation. The etiology is problematical, although direct extension of organisms to the gland from the mouth through Stenson's duct seems to be the most likely explanation. Perhaps dryness of the mouth by some slight trauma to the mouth of the duct is the predisposing cause, although all proof thereof is wanting.

The recognition of pyogenic parotitis is so simple that errors in diagnosis are unwarranted. The close proximity of the regional lymph nodes to the gland is responsible for many errors. Lymphatic enlargement may closely simulate parotitis especially when the lower pole of the parotid is involved. It is often impossible to make a diagnosis on the character of the swelling alone. Failure to examine closely the parotid duct is responsible for the majority of errors. It will often be sufficient to observe whether the duct is inflamed and gapping and pus can usually be expressed from the mouth of the duct. In cases of doubt, where pus cannot be expressed, the introduction of a simple glass cannula into the ampulla of the duct and some of the secretion withdrawn for examination will establish a positive or negative diagnosis in every instance. If a smear shows pus cells and a pure strain of bacteria the diagnosis is estab-

lished. The introduction of such a catheter is perfectly simple, especially if the ampulla of the duct is inflamed. In every swelling of the face and neck in the region of the ear, a possibility of septic parotitis should be considered seriously and a careful examination of Stenson's duct should be made.

SUMMARY

1. Pyogenic parotitis in otherwise healthy individuals does occur, and perhaps more frequently than is generally recognized.

2. The condition must be distinguished from (a) mumps, (b) lymphadenitis, (c) neoplasm, (d) cellulitis of the face and neck. The diagnosis may be made with certainty by careful observation of Stenson's duct and by catheterizing the duct in doubtful cases.

3. The catheter specimen obtained from the parotid duct in septic conditions of the gland will yield an abundance of polymorphonuclear leucocytes and a pure culture of organisms.

4. Expectant treatment should be carried out until definite fluctuation occurs, then, surgical drainage should be established.

5. The cases of pyogenic parotitis in otherwise healthy individuals tend to run a mild course and a spontaneous recovery is often made. On the other hand, when the condition occurs in a severely debilitated patient, the condition is much more serious and the prognosis should be guarded.

BIBLIOGRAPHY

1 Howard, C. P., 1920: Nelson's Loose-leaf Living Medicine, Vol. V, p. 21. Thomas Nelson & Sons, New York.
2 Tice, 1921: Practice of Medicine. V. F. Prior & Co., Hagerstown, Md.
3 Oxford Medicine, 1921. Oxford University Press, American Br., New York.
4 Smith, Eustace, 1909: Allbutt and Rolleston, System of Medicine, Vol. II, Pt. 1, p. 589. Macmillan.
5 Riesman, D., 1908: Osler's Modern Medicine, Vol. V, p. 70. Lea & Febiger, Philadelphia and New York.
6 Kraus, F., 1902: Die Erkrankungen der Mundhöhle u. der Speisevöhre, Nothnagel's Specielle Pathologie und Therapie, Bd. XVI, I, S. 91. Hölder, Wien.
7 Keen's Surgery, 1914. W. B. Saunders Co., Philadelphia and London.
8 Oxford Loose-leaf Surgery, 1920. Oxford University Press, New York.
9 Ochsner, 1921: Surgical Diagnosis and Treatment. Lea & Febiger, Philadelphia and New York.
10 Parmentier and Chabrol, 1923: Nouveau Traité de Médecine (Roger, Widal, Teissier), T. XV, D. 1-48. Masson, Paris.
11 Heineke, H., 1913. Verletzungen und chirurgische Erkrankungen der Speicheldrüsen Deutsche Chirurgie, Bd. 33, S. 406-455. Enke, Stuttgart.
12 von Mikuliez and Kümmel, 1912. Die Krankheiten des Mundes, S. 188. Jena.
13 Carr, 1905: A Case of Primary Suppurative Parotitis. Lancet, 1905, 2, p. 825.
14 Day, 1889: Idiopathic Acute Parotitis; Sloughing of Entire Gland; Recovery. Med. News, Philadelphia, Vol. 4, p. 212.
15 Jeffries, 1858: Idiopathic Parotitis with Ulceration and Destruction of the Arterial Coats. Memphis Med. Rec., 1858, p. 209.
16 Blair and Padgett, 1923: Pyogenic Infection of the Parotid Glands and Ducts. Arch. of Surg., July, 1923, Vol. 7, No. 1, pp. 1-36.
17 Honigmann, F., 1920: Primary Acute Suppurative Parotitis. Deutsche Zeitschr. f. Chir., Bd. 160, S. 252.
18 Gilbert and Lippmann, 1904: Le microbisme salivaire normal. Compt. rend. à la Soc. de Biol. de Paris, T. 56, p. 374.
19 Claisse and Dupré, 1894: Etude anatomo-pathologique de quelques cas de parotite. Bull. de la Soc. anat. de Paris, 1894, p. 32.
20 Gallippe, 1894: Note sur la présence de microbes dans les conduits excréteurs des glandes salivaires normales. Compt. rend. à la Soc. de Biol., T. 46, p. 100.
21 Sicard and Dopter, 1905: Cytologie du liquide parotidien dans les oreillons. Presse Méd., 1905, Num. 29, p. 225.
22 De la Prade and Loiret, 1919: Cytologie et physiopathologie comparées des salives sous-maxillaires et parotidiennes des oreillons. Jour. de Méd. de Paris, Sept., 1919, Num. 9.
23 Küssmaul, 1879. Berl., Klin., Wchnschr., No. 15, 1879.

The Diminution In Heart Size In Circulatory Collapse: A Report of a Case*

GUY WELLS, M. D., AND BURGESS GORDON, M. D.

During some recent studies† on changes in heart size in patients suffering from various forms of cardiac disease, one patient entered the hospital showing signs of very marked circulatory collapse. The history previous to admission and the course in the hospital is as follows:—

M. J. G., Medical Number 21158, age 28, a single housemaid, was admitted to the medical service of the hospital on the evening of May 13, 1923, complaining of abdominal pain. The family history was negative. Jaundice six years ago was the only important finding in the past history.

Present Illness. The onset occurred three days before admission. During breakfast the patient was suddenly seized with a severe cramping abdominal pain which did not radiate. The pain was constant during most of the day. She vomited every fifteen to twenty minutes throughout the forenoon and less often in the afternoon. Late in the day about two teaspoonfuls of blood were vomited. The patient had had three similar attacks, one three years ago, another one year ago, and the third ten weeks before entrance. Seven weeks before the present illness appendectomy had been performed. The appendix was found kinked upon itself. The pelvic organs were noted to have been normal. In the present illness morphine had been given with some relief from the abdominal pain and vomiting. The pain recurred, however, at intervals for three days when the patient was sent to the hospital.

Physical examination showed a well developed and nourished woman lying on her left side, obviously uncomfortable. Heart; the apex could neither be seen nor felt. Left border of dullness was 6 1/2 cm. to the left of the midsternal line in the fifth interspace. The right border of dullness was not beyond the sternal margin. The heart action was regular, rate 130 beats per minute. No murmurs were heard. Abdomen; was well developed. symmetrical and soft. No pulsations, masses or spasms were felt. There was some generalized tenderness all over the abdomen which was more marked in the epigastrium and to the right of the umbilicus, but there was no acute tenderness. No evi-

*From the Medical Clinic of the Peter Bent Brigham Hospital.

dence of fluid or hernia was found. Otherwise, the physical examination was negative.

The temperature on admission was normal, respiration was 28 per minute. The patient did not seem acutely ill. Ten hours after entrance, the abdominal pain increased. The lips and cheeks were cyanotic, the extremities were moist, cold, and clammy, the radical pulse could not be felt. The apex rate was 200. The blood pressure could not be obtained, the temperature rose to 103.3° F. The abdomen was not distended but was moderately rigid. Tenderness over the abdomen was not increased or otherwise changed. The patient vomited occasionally. The urine showed the slightest possible trace of albumen. Blood; 9 A. M. the day after admission, hemoglobin 147%, red blood count 7,000,000, white blood count 3,700, polymorphonuclears 80%, lymphocytes 15%, large mononuclears 5%. Morphine and subpectoral saline were given. At three o'clock in the afternoon the red blood count was 5,900,000, and the white blood count 41,000. At this time an acetone-like odor was detected on the breath, and the blood CO_2 was 39.3 vol. per cent. Stools were positive for blood by the benzidine test, vomitus was slightly positive for blood. Electriocardiogram showed a normal curve. Wassermann reaction was negative. The general condition remained about the same during the day except for cessation of vomiting. By the second morning after admission the condition had improved. Cyanosis had diminished, the pulse at the wrist was 150 beats per minute. The extremities were warm. An enema was given with a good fecal result, but the vomiting began immediately following the enema. The patient was transferred on the third day after admission to the surgical service, where a laparotomy under novocain was performed. A loop of jejunum presented and was noted to be dilated about one and one half inches in diameter and slightly injected. The transverse colon was slightly distended. Exploration was incomplete, the liver and stomach were normal to sight and touch. Nothing was felt in the gall bladder or pancreas. Nothing abnormal was felt within reach of the fingers. A gall bladder tube was tied into a loop of the jejunum about two feet below the stomach and sutured to the abdominal wall, and the wound closed. Two days after operation the red blood count was 4,600,000. The tube was removed at the end of ten days. Recovery was uneventful and the patient left the hospital thirty days after admission with a diagnosis of questionable acute abdominal obstruction, cause and site unknown.

The patient entered the hospital complaining of abdominal pain. Ten hours after admission, it was impossible to feel the radial pulse, the heart rate was 200 per minute, her lips and cheeks were cyanotic, the extremities were cold and clammy and her blood pressure could not be obtained. The patient became markedly dyspnoeic and on two occasions it seemed as though she were dying. She was given three subpectoral saline injections and morphia for pain and during the second day her condition seemed improved. The red count had dropped from 7,000,000 to about normal, the pulse was 150 at the wrist and the cyanosis had diminished. She was operated on under local anaesthesia, as the patient seemed to be suffering from some acute surgical abdominal condition. No significant pathology was found at that time, but it was thought that she had an intestinal obstruction. Her convalescence was uneventful and she was discharged well.

Seven X-ray pictures of the chest were made during the period of marked collapse, four within a period of about twelve hours. In all exposures the heart size was very small and not unlike the shape of an orange. The greatest diameter during this period was 10.6 cm. The dimensions were considerably increased after the critical period had passed and on the day of discharge the transverse diameter was 13.1 cm. and the shape was approximately normal. There was no evidence in the history to suggest that the patient had suffered from heart disease and the studies carried on during her stay in the hospital also failed to show any signs of heart damage.

Cannon[1] has summarized certain observations on the increased viscosity of the blood in shock. He has mentioned the possibility that because of the "concentration of the corpuscles, due either to transudation of plasma or to a slowing of the circulation from a diminished arterial pressure, the small veins and capillaries, certainly in the intestinal wall and perhaps elsewhere in the body, may become more or less permanently plugged with corpuscles." It would not seem unlikely that the diminished size of the heart during the most severe stage of the patient's illness was possibly due to the blood concentration or to an actual decrease in the amount of circulating fluid to the heart and consequently a lessened output to the arteries. Meyer[2] has reported a diminished heart size in a patient who suffered from a marked gastric hemorrhage. Eyster and Meek[3] and others[4] have shown experimentally that the heart decreases in size after bleeding. We have been unable to find in the literature, however, observations on the heart size in patients in shock with no history of frank hemorrhage. The question arises, does shock, due to trauma or other causes such as may have played a part in this case, usually cause indirectly a diminution in the size of the heart.

†The plan for studying this patient and others[5] suffering from severe forms of heart disease has been as follows:—The bed used was a simple modification of the familiar type of Way bed. The spring and that part of the mattress used to support the body of the patient, as employed in the original con-

struction, has been replaced by a heavy canvas sheeting, laced and adjusted to the iron frame work. The mechanism for elevating the back rest and other parts of the frame remain unchanged.

The film rest was constructed from parts of a bed side table. The table top having been replaced by a 1 by 11 by 14 inch board with two adjustable U-shaped side arms to accommodate different sizes of film screens, this board was clamped to the cross bar by means of a collar and a heavy wing nut; this construction provided a way for adjusting the film to different angles within a sliding horizontal range of 18 inches. There was also a wing screw adjustment on the leg of the table to give the film rest the required height. The entire mechanism rested on a wooden box with large roller castors. A standard type of portable X-ray apparatus was used in making the pictures. There was no change in its construction.

The technique employed was as follows:—The back rest was covered with a medium weight blanket and a light feather pillow and adjusted to the most comfortable position of the patient who was lying straight in bed and flat on his back. The knee rest was then adjusted so as to prevent the patient from sliding downward in bed. The film board with the screen inserted was moved in front of the chest, the upper border close to the chin and the centre of the screen one cm. above the most prominent part of the sternum. The angle was made to correspond as nearly as possible to that of the back rest, both being determined by means of a dial and recorded in degrees. Measurements were also taken between the shoulder joints and the upper cross bar of the iron frame work and used in subsequent examinations for determining the position of the patient. The X-ray machine was placed directly back of the canvas bed rest, the Coolidge tube lowered close to the floor and the target turned upward so that the X-ray beam was perpendicular to the bed frame and screen, thus avoiding distortion. The distance between the target and the patient's back was determined from a fixed point on the canvas and was always in direct alignment. In most instances the angle of the back rest was about 40° and the distance between the tube and the fixed point on the canvas about one meter. It was the plan to elevate the back rest to the highest point compatible with the patient's comfort because with the increased angle the tube could be placed at a greater distance and thus more nearly approach the conditions of normal Roentgenography. In all events the same measurements and equipment were used in each case, so that changes in heart size could be accurately compared. In taking the Roentgenograms the exposures averaged thirty-five seconds with a spark gap of 4½ inches and a current of 10 milliamperes.

The use of this special bed, adjustable plate holder and a standard portable X-ray apparatus was arranged so that frequent heart plates of very ill patients could be taken without disturbing their position in bed. The method was employed as a substitute for teleo-Roentgenograms with the usual bed side technique which necessitated moving the patient each time an exposure was made.

We wish to thank Dr. Francis C. Newton for his kind co-operation during the studies on the Surgical Service.

BIBLIOGRAPHY

1 Cannon, W. B.: Traumatic Shock, D. Appleton & Co., 1923, 46.
2 Meyer, E.: Klin. Wchnschr., 1922, I, 1.
3 Meek, W. J., and Eyster, J. A. E.: Am. Jour. of Physiol., 1921, LVI, 1.
4 Gordon, B., and Wells, G.: "The Effect of Amyl Nitrite, Bleeding, and Epinephrin on the Blood Pressure and the Size of the Cat's Heart." (Unpublished.)
5 Cutler, E. C., and Levine, S. A.: Boston Med. and Surg. Jour., 1923, CLXXXVIII, 1023.

The Value of the X-Ray In Pulmonary Diagnosis

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MAX RITVO, M. D.

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THE value of the X-ray in the diagnosis of pulmonary diseases is well recognized at the present time. In most instances, the roentgen examination serves to confirm or to amplify the clinical findings; for example, if the patient has tuberculosis clinically, the X-ray usually confirms the diagnosis, so also in dealing with a case of lung abscess, the history, physical findings, and laboratory examinations will usually make the diagnosis clear, the X-ray serving to show the extent and localisation of the process. Every clinician, however, has doubtless met one or more cases in which there was a wide discrepancy between the clinical and the roentgen findings. Several instances of this type having come to our notice in a comparatively short time, we were led to make a study of a series of consecutive cases coming to the X-ray Department of the Massachusetts General Hospital for examination of the lungs. Each case was studied thoroughly, both from the clinical and from the radiological viewpoint, and the findings correlated.

As our work progressed, the cases divided themselves into four main groups, which were as follows:

Group I. Cases in which the clinical and X-ray findings were in accord.

Group II. Cases in which a definite diagnosis was based upon the history and physical findings, but where the X-ray findings were either negative, indefinite, or actually misleading.

Group III. Cases with absent or insufficient clinical findings, in which the diagnosis was based upon the X-ray evidence alone.

Group IV. Cases in which the clinical findings led to an incorrect diagnosis, while the X-ray examination gave the correct diagnosis.

Group I. Cases in which the clinical and X-ray findings were in accord.

The majority of our cases fell into this group, the X-ray confirming the clinical findings, whether positive or negative. As instances of the latter group, there were many patients with acute mild respiratory symptoms, in whom the clinical signs were absent or indefinite; and the fact that the X-ray was likewise negative was of extreme importance in ruling out serious pulmonary disease. Likewise there were many cases in which the history strongly suggested a diagnosis; such as an early pneumonia in children, a foreign body, encapsulated fluid, or a small abscess deep in the lung, but with negative or indefinite physical signs. In many of these cases, the X-ray examination confirmed the diagnosis based upon the clinical history, although the physical signs were absent, and made an early definite diagnosis possible. Most frequently the disease was sufficient to give a definite history and physical signs, which were confirmed by X-ray. In these cases, the roentgen findings often showed better than in any other way the extent, location, and progress of the disease. It is unnecessary to present

FIGURE 1. GROUP II, CASE 1.
All the finding in this case, with the exception of the X-Ray examination, pointed to bronchiectasis. An example of the type of case in which the X-Ray is of comparatively little value.

any cases in this group, as when all the findings are in accord the diagnosis should be clear.

Group II. Cases in which a definite diagnosis was based upon the history and physical findings, but where the X-ray findings were either negative, indefinite, or actually misleading.

Case I. M. E. T., age thirty, entered the hospital complaining of dyspnoea and weakness. Four years ago he had influenza followed by double lobar pneumonia, and since then he has had frequent colds and attacks of bronchitis, raising large amounts of muco-purulent sputum, averaging a cupful every morning. During the past three or four years, he has lost twenty pounds in weight and has become very weak. He has had frequent night sweats, but no hemoptysis.

The physical examination showed both clavicles prominent. There was diminished expansion of the left chest. The lungs showed emphysematous breathing with many fine musical and crackling râles over the entire chest. There was no dullness. The fingers and toes showed slight clubbing. The heart was negative. During his stay in the hospital his temperature averaged 97.5 to 99 degrees, pulse 100, and respiration 25. The sputum was large in amount, muco-purulent, and contained no blood; no tubercle bacilli were found on four different examinations; there was a large number of gram-negative bacilli both extra- and intra-cellular and many gram-positive diplococci.

X-ray examination (Figure I) showed enlargement of both hilus shadows, especially the left. The lung markings were prominent, these changes being of fairly uniform distribution and extending into the periphery of the lungs and into the apices. There was no definite evidence of consolidation. The appearance was not that of tuberculosis.

Discussion

In this case the history, physical findings and sputum examination are consistent with bronchiectasis. The X-ray helps to rule out tuberculosis but gives no assistance in making a definite diagnosis. It illustrates the fact that in many instances the clinical evidence is the important factor, the X-ray being of comparatively little value. This is particularly true in cases of bronchiectasis. Radiologists have known for a long time that in the diagnosis of certain cases of this disease the X-ray evidence may be of little or no value. In 1916 Moore, discussing bronchiectasis from the standpoint of the radiologist, divided it into three stages or types; first, the infiltrative; second, the cylindrical; and third, the sacculated. He states that the infiltrative type presents the chief difficulties to the roentgenologist, so that it is often impossible to make a definite diagnosis; and that in the cylindrical type, should the process be confined to that portion of the left lung which is hidden by the superimposed heart-shadow, a diagnosis may be impossible; likewise in the sacculated type, characterized roentgenographically by the localization of distinct pseudo-cavitations surrounded by dense fibrous tissue, the fibrous tissue surrounding these groups of sacculations may be so dense and the cavitations so filled with secretion that the shadow on the roentgenogram is homogeneous and the diagnosis difficult.

Cases which fall into this group are comparatively rare. The reason for this is clear. Lesions involving the pleura manifest themselves by limitation or fixation of the diaphragm, which fluroscopy reveals. So also, lesions involving the parenchyma of the lung are seen as areas of density roentgenographically. However, infiltrations of the bronchi may be difficult or at times impossible of diagnosis, as pointed out by Moore and as evidenced by the above illustrative case.

Group III. Cases with absent or insufficient clinical findings, in which the diagnosis was based upon the X-ray evidence alone.

Case I. H. M., forty years of age, entered the hospital complaining of pain and swelling of the abdomen of eight months' duration. The pain was localized in the right upper quadrant and was associated with gas and pyrosis. For the past three weeks the pain had been increasing in severity. He had not lost any weight or strength. The physical examination showed a

FIGURE 2. GROUP III, CASE 1.

Metastatic Carcinoma of the lungs, evidenced by numerous areas of dulness scattered diffusely through both lung-fields. There were no pulmonary symptoms or definite physical signs, making a clinical diagnosis impossible.

well developed and nourished man. The lungs showed no dullness or change in breath sounds; no râles were heard. The heart was negative. The liver dullness extended from the fifth rib to 9 cm. below the costal margin. There was shifting dullness in the flanks and slight tenderness in the right upper quadrant.

The X-ray examination (Figure II) showed the liver shadow large with tenderness over the lower margin. Both lung fields were studded with numerous diffusely scattered areas of dullness, the largest of which was 1 to 1.5 cm. in diameter. A diagnosis was made of probable carcinoma of the gall-bladder or liver with pulmonary metastasis.

The autopsy showed carcinoma of the liver with extensive pulmonary metastases. The nodules of new growth tissue were scattered through the substance of the lobes of both lungs.

Discussion

It is hard to believe that such extensive disease, as shown by X-ray and confirmed by autopsy, could have existed without giving rise to definite physical signs and symptoms in the chest. The absence of any pulmonary symptoms or definite physical signs made a diagnosis of any pulmonary involvement impossible when the case was first seen in the Out-Patient Department. It was not until a routine X-ray of the chest had been taken that the pulmonary condition was first detected.

Case II. J. H., a woman of forty-two years, was kicked on the left breast by a cow, causing

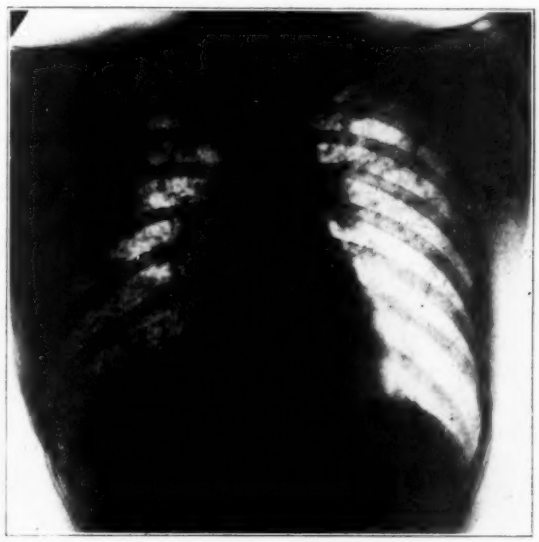


FIGURE 3. GROUP III, CASE 2.

Diffuse fine mottling throughout both lung-fields, probably metastatic carcinoma. Repeated physical examinations negative.

soreness and severe pain. Physical examination four months later revealed a small, firm non-tender nodule about the size of a walnut in the upper and outer quadrant of the left breast. Amputation of the left breast with dissection of the axilla for carcinoma was performed. The pathological report was as follows: carcinoma with extensive metastases to the axillary lymph nodes.

X-ray treatment was started following the operation, six treatments being given. The patient felt quite well after these treatments and examination showed no evidence of local recurrence or of metastases.

A year later the patient returned to the hospital complaining of pain in the left shoulder and a dry cough of two months' duration. The

physical examination showed fullness in the left axilla and one gland three cm. in diameter in the left supraclavicular region. The heart and lungs were negative on physical examination.

The X-ray examination (Figure III) showed diffuse mottling throughout both lung fields. The hilus shadows were increased in density. The findings represented probable metastases in the lungs.

The physical examination of the lungs repeated two months later again failed to show any dullness, râles, or change in breath sounds.

Discussion

It is interesting that in this case, as in the preceding case, the physical examination of the lungs was negative although the X-ray showed metastases.

These cases represent a small but extremely important group in which an early diagnosis can be made only by the X-ray. The absence of clinical signs is very striking. That this is a common finding is pointed out by Carman who states that "the clinical manifestations of metastatic malignancy to the lung are very indefinite." Both of these cases illustrate the necessity of taking routine plates of the chest in all cases of malignant disease, even in the absence of any signs or symptoms referable to the lungs.

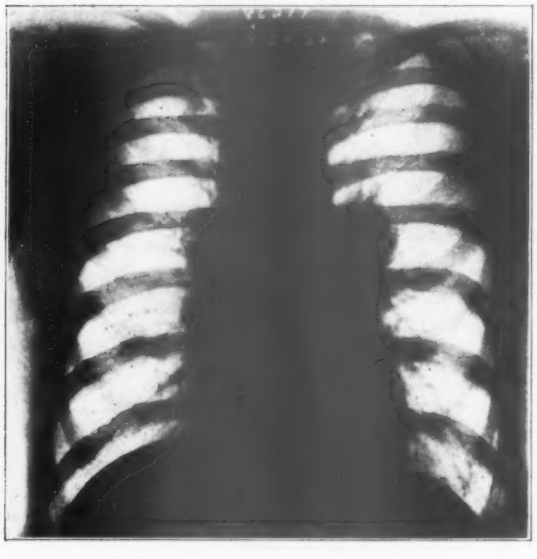


FIGURE 4. GROUP IV, CASE 1.

Hodgkin's disease involving the glands at both lung roots. This patient had been sent to Arizona, a clinical diagnosis of tuberculosis having been made.

Group IV. Cases in which the clinical findings led to an incorrect diagnosis, while the X-ray examination gave the correct diagnosis.

Case I. F. A., a man aged thirty-two years, entered the hospital with the following history. He has always been subject to colds and has had an occasional dry cough for years, but has had no hemoptysis. One year ago he began to have cough with small amounts of sputum. He lost weight and strength and began to have marked night-sweats. He had no pain in the chest, did not lose his appetite, and there was no nausea or vomiting. On the advice of his physician, who suspected tuberculosis, he went to Arizona, where he remained six months, after which he felt well enough to return to work as a motorman. He has felt quite feverish during the past few weeks; and two weeks ago, because of weakness, loss of seventy pounds of weight and return of his night-sweats, he gave up work.

The physical examination was entirely negative, except for a small bean-sized gland above the left clavicle. The temperature was 103, pulse 120, respiration 40. The sputum was negative for tuberculosis; there were occasional gram-negative bacilli and many long chains of streptococci.

The X-ray examination (Figure IV) showed a definite extensive area of dullness, somewhat irregular in outline, extending into the right lung field along the mediastinum. A similar area was present along the left border of the heart at the lung root. The periphery and apices of the lung fields were clear. The posterior mediastinum was definitely obliterated, except at the extreme base and in the upper portion. The heart was not displaced. The appearance was that of very much enlarged mediastinal and peribronchial glands. There was nothing in the picture which suggested tuberculosis, and a diagnosis was made of probable Hodgkin's Disease.

The patient was given intensive X-ray treatment with immediate and remarkable improvement. In ten days his temperature, pulse, and respiration fell to normal and his symptoms entirely disappeared.

Discussion

The diagnosis of tuberculosis was made in this case on the history and on the patient's condition. The fact that the routine X-ray examination of the chest taken when the patient entered the Massachusetts General Hospital showed very markedly enlarged mediastinal glands and led to the diagnosis of Hodgkin's Disease, emphasizes the importance of an early X-ray examination in the differential diagnosis between tuberculosis and Hodgkin's Disease, thereby enabling treatment to be commenced in the earliest stages, which is such a vital factor in the treatment of these diseases. It appears likely that if an X-ray examination of the patient's chest had been made at the first examination he would have been saved the trip to Arizona and that with X-ray treatment he would have been relieved of his symptoms much more quickly.

Case II. J. C., a man aged twenty-two years, entered the hospital complaining of cough and

pain in the left upper chest. Three months ago he caught cold and since then he has had a dry cough and pain over the left side. He has lost some weight, often felt drowsy, and noticed that he tired easily. His appetite has become very poor. In the morning he raises about a teaspoonful of sputum. Three weeks ago and again one week ago his doctor told him that his temperature and pulse were a little above normal. He has spent the last two weeks in bed without improvement. He has had no night-sweats or hemoptysis. His usual weight is 135, his present weight 120. On physical examination, there was marked dullness over the left apex to the second rib in front and the spine of the scapula behind. Over this area there were may fine dry râles, slightly prolonged expiration, and diminished tactile and vocal fremitus. The heart and abdomen were negative. In the epidydemis of the right testis there was a small, hard, non-tender nodule.

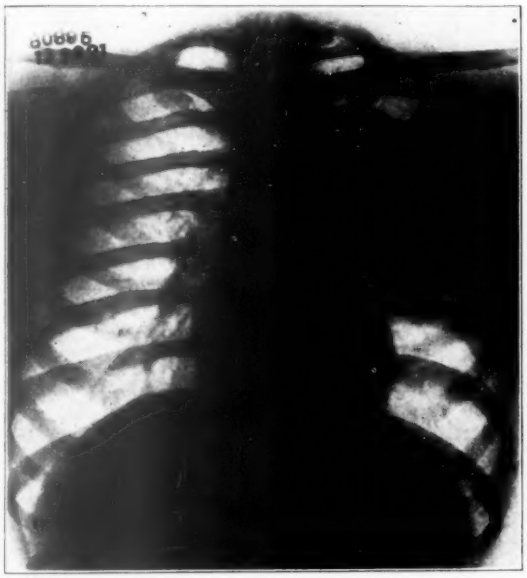


FIGURE 5. GROUP IV, CASE 2.
Large tumor mass in left upper lung-field. The history and clinical findings pointed definitely to tuberculosis.

The clinical note entered in the history at this time was: "History fits in very well with tuberculosis of left lung and right epidydemis."

The X-ray report (Figure V) was as follows: Extending from the first to the fourth rib on the left side is a round dense shadow the size of a small grape-fruit. In the left oblique position this shadow is seen to be distinct from the supracardiac dullness. This area is sharply outlined against the lung parenchyma, and does not pulsate; it is slightly lobulated in appearance and suggests a tumor mass within the lung substance. In view of the X-ray findings a specimen of the nodule in the epidydemis was removed; the pathological report of the specimen showed tumor cells corresponding in appearance and arrangement to the common malignant tumor of the testis and was diagnosed as spermatozoal carcinoma.

Discussion

The history and all the clinical signs pointed definitely toward tuberculosis in this case, and were it not for the X-ray examination the patient would in all probability have been treated as tuberculous. It emphasizes the importance of an X-ray examination in what would appear, from the history and physical findings, to be a clear-cut case of tuberculosis.

We have given these illustrative cases to show the value of the X-ray examination in the diagnosis of pulmonary conditions and to emphasize the great need for closer coöperation between the clinician and the radiologist. The roentgen examination forms but one of the numerous factors essential for diagnosis, and its value as an aid in diagnosis varies according to the type of case. In some cases the evidence obtained from the clinical findings outweighs that derived from the X-ray examination; in other cases the reverse is true; and it is only through the careful balancing of all the factors that a correct diagnosis can be made.

In conclusion we wish to express our thanks to Dr. George W. Holmes of the X-ray Department of the Massachusetts General Hospital for the privilege of carrying on this work, and for his many valuable suggestions.

BOOK REVIEW

Aromatics and the Soul: A study of smells. By Dan McKenzie, M. D. (Glasg.), F. R. C. S. (Edin.). New York: Paul B. Hoeber, Inc., 1924.

The aesthetics of every sense, save that of smell, have been hitherto studied and systematized. This monograph of McKenzie's is one of the earliest attempts to study osmics from the artistic and metaphysical as well as from the scientific and physiologic standpoint. The connotative significance of odors in literature has been realized from the days of King Lear and Lady Macbeth to those of Meredith's jessamine and Kipling's wattle. In our own lives we recognize the cogency upon us of incense and peat-smoke, of lilac and honeysuckle of old books and of the east wind, as we do that of evening bells upon our emotions. Hence, McKenzie views aromatics in their relation to the soul, just as one views music and painting, poetry and retigion. Though our sense of taste is largely smell, the purely olfactory sensations are among the most spiritual of which we are capable, as they are the most subtle in causation; for it is chiefly through the avenues of sight, sound, and odor that our souls can obtain physical contact with the infinite. [R. M. G.]

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, ASSISTANT EDITOR

CASE 10201

A Polish housewife of thirty-five entered March 11 complaining of epigastric pain and vomiting. She spoke English very poorly, did not coöperate well, and gave an unreliable history.

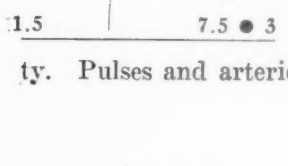
F. H. She did not know the causes of death in her family. She had lost a first husband and a son of five years. She had had one miscarriage since her second marriage; no other pregnancies.

Habits. She drank wine in moderation.

P. H. She had always been well. Two years ago she had a severe nosebleed. For the past year she had had color visions and at times buzzing in the ears. She had occasional sore throats. Urination, day 6-10, night 5. She had occasional twitching of the eyelids and the skin of the arms. She thought she had lost considerable weight.

P. I. Three months ago she had pain starting in the epigastric region and radiating up the left breast and down the left arm, severe, sharp (?), coming on at first three times a day, a few minutes after eating. Later on she would have several attacks during the night, also waking with a start in severe pain. Efforts at stool also started the attacks. During the past two weeks the pain had been continuous, keeping her in bed. During the past few weeks she had vomited without relation to meals. For three days she had eaten nothing, but had vomited five or six times a day. She had considerable trouble with belching of gas, which relieved the pain for a while. For nine years, ever since she came to this country, her bowels had been constipated, moving once in three or four days. Two months ago she had a severe nosebleed.

P. E. A well nourished woman, retching at intervals. Teeth few and poor. No abnormalities of the *lungs* recorded. Apex impulse of the *heart* in the fifth space. Percussion measurements as shown in the diagram. Action irregular. Sounds of fair quality. Diastolic murmur at the left border of the sternum. A_2 over the aortic area accentuated and musical in quality. Pulses and arteries normal. B. P. 100/75.



Abdomen negative except for tenderness over epigastrium. *Genitals, extremities, pupils, reflexes* and *rectal examination* normal.

T. and *R.* normal. *P.* 90-101. *Urine.* Amount normal on the one day recorded, sp. gr. 1.018-1.028, a very slight trace of albumin at one of two examinations, sugar at one, leucocytes at both, red blood cells at one. *Blood.* Hgb. 85%, leucocytes 30,000-20,000, polynuclears 80%, reds normal, platelets increased. *Wassermann* strongly positive. *Stool* negative. *Electrocardiogram.* Sinoauricular tachycardia. Rate 120. Left axis deviation. Index +22.

Orders. Soft solids. Rectal glucose ℥ viii every four hours. Veronal gr. x in ten o'clock glucose.

While in the ward the patient continued to have attacks of pain without vomiting. In the intervals she was relatively comfortable. March 14 she was comfortable and talked with her husband at one o'clock. At two o'clock she went to the electrocardiograph laboratory, where a record was taken. At 3:15 she was found gasping. When seen she had a cyanotic pallor and was pulseless, with slow and labored respirations. In twenty minutes she died.

DISCUSSION

BY DR. RICHARD C. CABOT

NOTES ON THE HISTORY

There is nothing that I can suspect or speculate about on the basis of the history up to the beginning of the present illness.

I think we have to make charitable allowance for the fact that the patient was so sick that a good history could not be obtained. There are several clues started here and not followed up about which we should like to know a good deal more. For instance, a pain that goes down the left arm makes us think at once of angina or coronary block. But we need to know more. It seems to have some relation to exercise, since it started at stool, but also it comes on in the night. It seems also to have a relation to eating. We should like to have some details of the digestive state. This suggests stomach lesion, but not constantly. Then we have some things which make us think of chronic nephritis, especially the two nosebleeds and the vomiting without relation to meals. But I am still in the dark, as I think anybody must be without physical examination.

NOTES ON THE PHYSICAL EXAMINATION

Without knowing the size of the chest we do not know whether the heart dimension is half of the chest or not. We have not yet come to caliper measurements of the chest, though I do not see why it is not a rational way to do.

DR. PAUL D. WHITE: We tried it in the past and gave it up because it seemed to be less sim-

ple than using the midclavicular line, which is a satisfactory measurement. We measure directly with a small rule from the midsternum to the outer end of the clavicle and divide by two. We then measure the distance from the midsternum to the *maximal* apex impulse and the left border of dullness by percussion. The maximal apex impulse, when the heart is of normal size, is not beyond the midclavicular line. It is a fairly satisfactory measurement; the midclavicular line does not vary the way the nipple line does. We have compared the caliper measurements with X-ray measurements. Dr. Dorrance and I did this work, but never published the results. All one needs is a little ruler for the measurement of the midclavicular line.

DR. CABOT: I can see that the calipers would be more expensive, but I should not think the loss of time in its use would be great. If the X-ray people are going to measure as they do, and if we are going to make comparisons as we do, I do not see how we can use anything but caliper measurements.

DR. WHITE: The thickness of the chest wall and large breasts make a difference with caliper measurements.

DR. MEANS: You can get the caliper right down to the ribs by a little pressure.

DR. WHITE: Not always.

DR. CABOT: The only thing that means anything to me in this diagram is "three cm. outside the nipple line," and that does not mean much, as the nipple line in a woman of this age is not very satisfactory. This may mean the midclavicular line, but it is not so stated. So far as it signifies anything it seems to signify enlargement.

MISS PAINTER: It was the midclavicular line.

DR. CABOT: Dr. White, what does "Index plus twenty-two" mean?

DR. WHITE: That refers to a rough quantitative electrocardiographic index of axis deviation which Dr. Bock and I worked out a few years ago; this is on the edge of normal. Anything more than "plus twenty" is indicative of abnormal left axis deviation, and on the other hand anything less than "minus ten" means abnormal right axis deviation.

DR. CABOT: So that the support given by this to the percussion measurements is something, but rather small.

DR. WHITE: Yes. It is rather in keeping with aortic regurgitation.

DR. CABOT: But not very much, because we should expect a bigger heart. This is only evidence of slight hypertrophy of the left ventricle. We should expect considerable hypertrophy of the ventricle.

DR. WHITE: They do not match very well, the electrocardiographic evidence of ventricular preponderance and the actual ventricular weights at necropsy. The agreement is not very close.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: There must be more in the mind of somebody than is in the record, at any rate as to what happened after she got here. Dr. White, what about these attacks of pain of which we have no further description here than that they were attacks of pain? Were they of the coronary type?

DR. WHITE: When I saw her I thought they were quite typically of anginal character.

DR. SEGALL: At the time I saw her she appeared comfortable, but said that she had a dull ache in the epigastrium. She said that at times she had more severe pain, but that the ache was constant.

DR. WHITE: I have my note here, made on the 14th of March before death: "The history of duration, type and radiation of pain with recent increase and nausea, the gallop rhythm, poor heart sounds at apex, low pulse pressure in spite of well marked aortic regurgitation and presence of luetic involvement of aorta suggest coronary occlusion. Leucocytosis would be in accordance. Electrocardiogram should help. Gastric ulcer must be ruled out, but I believe is less likely. Absolute rest."

DR. CABOT: What was the evidence during life of luetic aortitis, aside from the murmur?

DR. WHITE: The age and the positive Wassermann.

DR. CABOT: Did you have any radiographic evidence?

DR. WHITE: No, that had not been done then.

DR. SEGALL: She had a low peculiar T wave in the electrocardiogram such as we have found in coronary disease.

DR. MEANS: May I ask about the leucocytosis? I heard Dr. Libman yesterday speak of that point, and I gathered from what he said that leucocytosis is particularly suggestive of infarction of the myocardium.

DR. WHITE: I think fever and leucocytosis are both evidence of the infarction if we are in doubt. They sometimes help us in making the diagnosis of coronary occlusion.

DR. CABOT: This additional information is just what we need in differentiating this case from a stomach case. If we simply know that she had pain and tenderness in the epigastrium, it is nothing. But Dr. White elicited the fact of the persistence of this pain and its association with collapse symptoms which would make us think of coronary block. The other thing that we certainly ought to think of would be obstruction at the mouth of the coronaries, in the aorta, which so often happens in luetic aortitis, which is suggested by the positive Wassermann and the diastolic murmur. With that I suppose it would be harder to account for the sudden death.

We have no good evidence of disease in the gastro-intestinal tract. It was not possible to get it while she was here, and we might get fooled with an organic stomach lesion. But on the whole I should concur with the opinion that Dr. White has already reached. This patient is rather younger than most of those I have seen with this trouble. Have you any idea why the aortic second sound should be accentuated and musical?

DR. WHITE: I did not find it so, as I remember it. I thought the heart sounds of poor quality and not accentuated.

DR. CABOT: I should like to know more about the relation of the belching of gas to heart troubles. We certainly see the two things together. People who have a great many attacks of angina will sometimes have angina and belch gas and sometimes belching gas will relieve the pain; sometimes they will have attacks of belching that seem to take the place of angina. They seem to be like what we used to call "an equivalent" in epilepsy. I have never had any idea what the relationship was.

DR. WHITE: They often go together. I have thought sometimes that patients have swallowed air and belched it, having once done it with relief, possibly owing to the fact that the attack was about to stop anyway; and they continued to do it.

DR. MEANS: I think the habit of swallowing air is often acquired in the attempt to relieve epigastric discomfort.

In heart disease a good deal of the gas is intestinal. One of the Fourth Year men this year made some investigations on the effect of a form of charcoal that Dr. Drinker had found more efficacious in relieving gas than ordinary charcoal. In this survey several of the patients studied were cardiacs. The ones who got most relief were those with gas in the bowel rather than in the stomach.

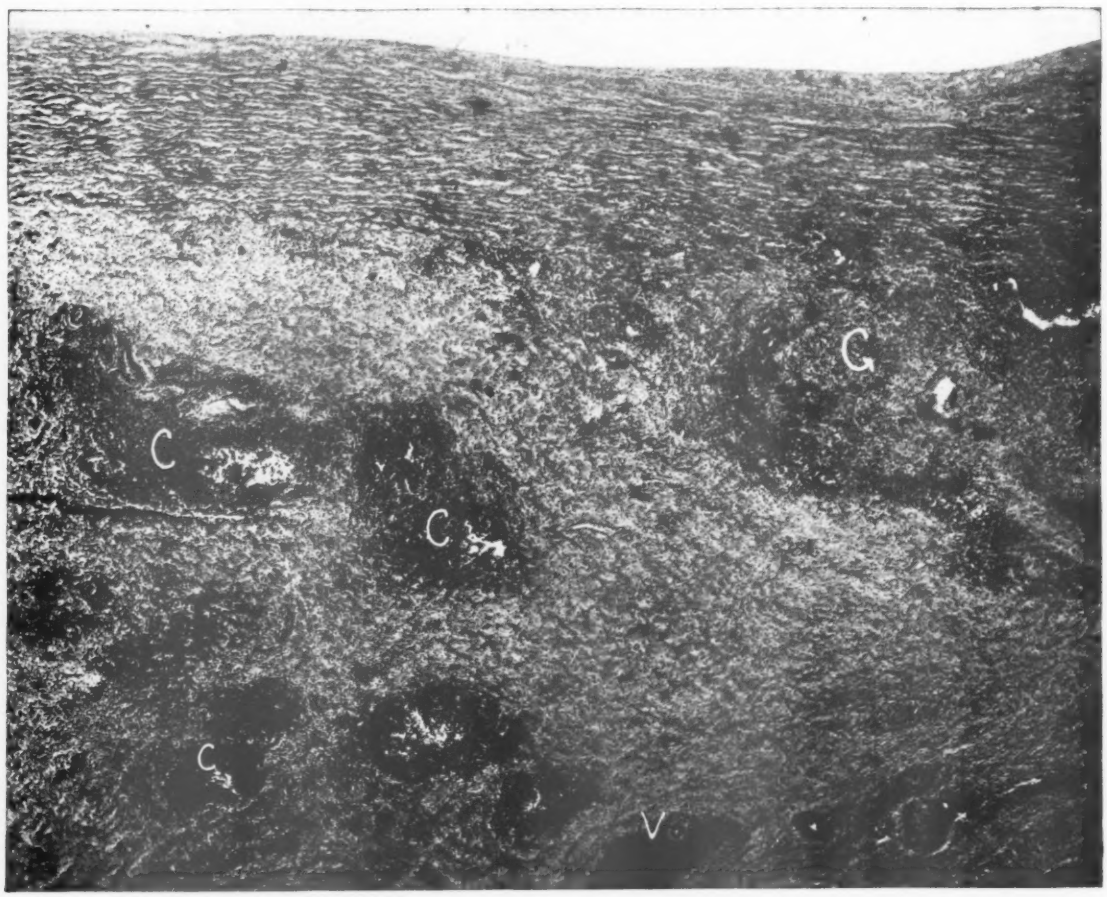


PLATE I. Pulmonary artery in a case of syphilitic endo-aortitis (Case 4122, Case Records of the M. G. H., Vol. IV, No. 12, Part 2, March 19, 1918). G, gummatous focus. Areas of cellular infiltration are well shown at C, C. Cellular infiltration about a blood vessel at V.
DR. OSCAR RICHARDSON.

DR. CABOT: Dr. Palfrey pointed out that belching is a normal thing that every one does and ought to do, and that what happens to a stomach patient is that because of atony or spasm he does not belch as he should, and so gas collects and comes up in large quantities instead of coming up in small quantities as it does in the rest of us. That seems to me a very good

observation. If passive congestion of the stomach gives atony of its wall we can see why they ought to have gas. But what interests me is the relief of cardiac pain by belching.

DR. WHITE: Most of these angina pectoris cases do not have any passive congestion of the stomach so far as we know.

DR. CABOT: No, so that does not help. Of course it has often been pointed out that angina is only a severer form of what anybody can get by running. Anybody who runs can feel substernal oppression. I have often felt it and belched gas and had the pain go off instantly. Why does the belching of the gas relieve pain? That is, how can a pain of circulatory origin be relieved by belching gas? Yet I am very confident that it is true, both in normal and in pathological conditions.

Myocardial infarction?
Hypertrophy and dilatation of the heart.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesions*

Luetic aortitis with some involvement of the aortic valve and partial occlusion of the coronary arteries.

2. *Secondary or terminal lesions*

Hypertrophy and dilatation of the heart.
Edema of the lungs.
Congestion of the spleen and kidneys.

3. *Historical landmarks*

Slight chronic pleuritis, left.
Chronic perihepatitis.

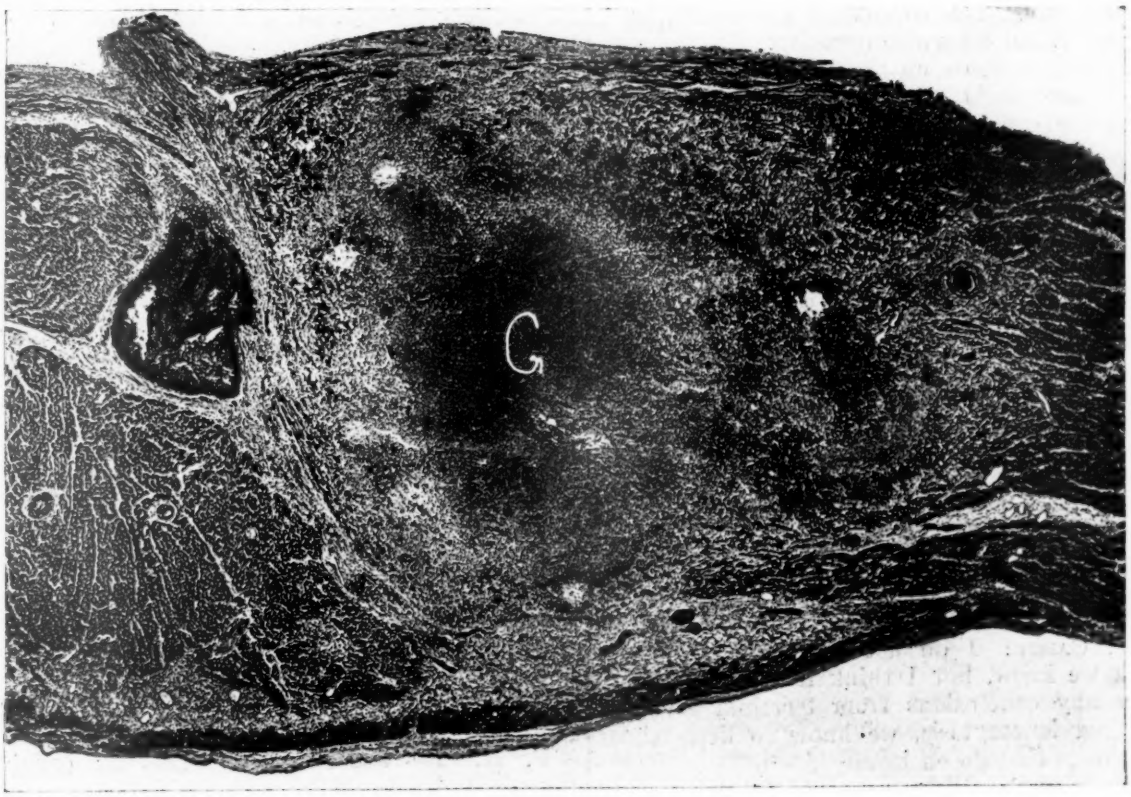


PLATE II. Heart muscle in Case 4122. G, gumma.
DR. OSCAR RICHARDSON.

I have nothing to add as to diagnosis to what I have already said. It seems to me more like coronary block at the mouth in the aorta or further down than anything else.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Syphilitic heart disease.
Chronic thrombosis.

DR. RICHARD C. CABOT'S DIAGNOSIS

Coronary occlusion.
Syphilitic heart disease (luetic aortitis?)
Small ovarian cysts.
Chronic pelvic peritonitis.

DR. RICHARDSON: There were only a few old adhesions to the pericardium on the left. The lung tissue was generally spongy, pale red and saturated with pale reddish frothy fluid—edema of the lungs.

The heart weighed 450 grams,—moderately enlarged for her. The myocardium was of good consistence, pale brown-red. In a few places there were some streaks and areas. We took pieces of this, but the myocardium was negative,

no areas of myocarditis or of syphilis. The heart was slightly dilated. The dilatation on the left was somewhat basin-shaped, not very markedly. The valve measurements were: the mitral 10.5 cm., the aortic 7.5 cm., the tricuspid 11.5 cm., the pulmonary 7.5 cm. The aortic cusps showed the usual fibrosis that we find in luetic aortitis, in this case not very extensive. The aorta presented the usual picture of gristly, scar-like intima, with sections across the wall showing thickening of the intima, thickening of the media and thickening of the adventitia associated with luetic aortitis. The adventitia was thickened, reddened, and in some places in the media there were areas which were pale and softer than elsewhere. The microscopical examination showed typical luetic aortitis.

This process in the aorta circled around the orifices of the coronary arteries, decreasing the right one considerably, and nearly occluding the left one. The coronaries themselves were very small but otherwise negative.

In several places on the surface of the liver there were slight indefinite streaks and areas where the capsule seemed to be a little thickened. The organ weighed 1390 grams. Grossly and microscopically it was negative.

The spleen was slightly enlarged. The kidneys weighed 325 grams. There was some congestion of the organs, but otherwise they were negative.

A PHYSICIAN: Does that coronary occlusion come under the head of a thrombus of the coronary?

DR. RICHARDSON: No. It is occlusion of the coronary orifice by the process in the wall of the aorta.

DR. CABOT: I should think it was definitely against the value of anything Dr. Means quoted from Dr. Libman, namely that leucocytosis and fever have some relation to infarction. There certainly was none here.

DR. WHITE: Could it come from the aortitis?

DR. CABOT: I do not think so. I do not think we know, but I think it is very rash to draw any conclusions from terminal fever or terminal leucocytosis, we know so little about the things that go on in any death.

DR. WHITE: With reference to the pain, I think this case is interesting because it does not help us in determining the mechanism of angina pectoris, for it may be said to support either Allbutt's feeling that angina pectoris is due to aortic involvement, or Mackenzie's theory that it is due to coronary spasm or narrowing. Therefore we have no proof here one way or the other. It should be said, however, that Mackenzie's theory is more probable than Allbutt's.

DR. CABOT: Do you know anything about syphilitic heart disease outside of the aorta?

DR. WHITE: No. There was a meeting a year or two ago in Boston on the subject, and a certain amount of ignorance was expressed. Dr. J. H. Wright said he had not studied the heart from this point of view and that he should pay more attention to the myocardium itself.

DR. CABOT: We see a great deal in literature and from Dr. Warthin about syphilis of the heart. Here we get it in the aorta and nowhere else.

DR. RICHARDSON: We have a case of syphilis of the heart. I will show you the pictures if you care to see them. (See illustrations.)

DR. CABOT: I think that would be instructive. I do not remember it.

DR. WHITE: Dr. Wright intimated at the meeting I mentioned that he had not studied the cases generally from the standpoint of the heart, but only from that of the aorta.

DR. CABOT: I saw a necropsy at the Johns Hopkins Hospital in which they demonstrated the gumma the size of a plum in the intraventricular septum including the bundle of His. It was very typical. It has been recorded, but we have not had it here.

DR. W. D. SMITH: It takes a long time for Dr. Warthin to find these things. He had a technician working for six weeks making sections of one heart before he found the spirochetes.

As far as the matter of fever in aortitis is concerned, I am perfectly satisfied that the cases frequently run fever. I have seen one or two cases where there was a question whether they had syphilitic aortitis or bacterial endocarditis.

DR. WHITE: And leucocytosis too? This is important to remember.

DR. W. D. SMITH: Yes, one of them did, and there was no other cause found than the syphilitic aortitis.

CASE 10202

An American editor of sixty-eight entered February 9.

F. H. Unimportant.

Habits. He used no alcohol. He smoked a good deal.

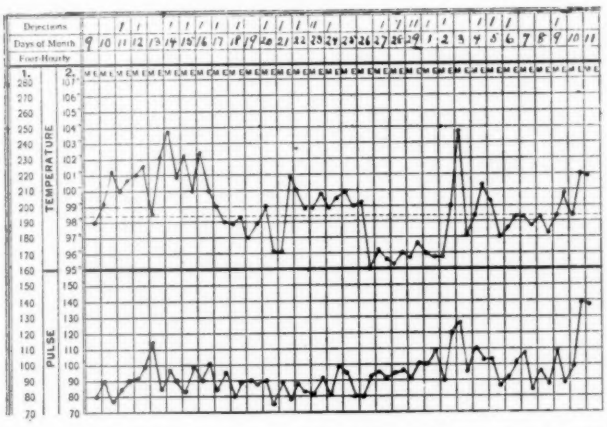
P. H. He had measles, whooping cough, mumps and scarlet fever as a child. Ten or twelve years ago he had an accident, possibly breaking a rib. Several years ago he had a chronic cough diagnosed as chronic bronchitis. At that time he used to have night sweats. The condition was diagnosed as non-tuberculous.

P. I. He had felt unusually well for a man of his age until five months ago. Then he had a severe coryza for three weeks without prostration or temperature. After recovering from the attack he felt entirely well until three weeks ago. Then he was profoundly prostrated and had great soreness of all the muscles, particularly in the back, and weakness. His temperature was about 99° to 100°. At times he had chilly

sensations. He had had a positive dislike for food and a slight tendency toward constipation. The condition had persisted. He thought he had not become worse except for recent mental depression. There had been no hemoptysis or loss of weight. Lately his medicine had been principally aspirin and veronal.

Close questioning as to the condition of the glands revealed nothing noteworthy except that one preauricular gland on the left had been enlarged for three years. The enlargement was now at a standstill.

P. E. A pale, rather thin man, lying quietly. Left preauricular gland the size of an olive, right preauricular the size of an almond. Glands in the neck and axillae the size of peas to beans. All of these movable and not tender. *Heart* not enlarged, regular. Soft systolic and questionable diastolic murmurs at the aortic area. *B. P.* 115/55. *Lungs.* No abnormalities recorded. *Abdomen.* A sharp, smooth, nontender liver edge felt 5 cm. below the costal margin in the midclavicular line on expiration. *Rectal examination.* Small external hemorrhoids. Internal sphincter too tight to admit finger without pain. No bleeding. *Genitals, extremities* and *pupils* normal. *Reflexes.* Right knee-jerk not obtained. Left obtained with difficulty. No clonus or Babinski.



T. and *P.* as shown in the *chart.* *R.* 18-32. *Urine.* ℥ 29-60, sp. gr. 1.016-1.022, turbid at one of six examinations, a very slight trace to a trace of albumin at five. *Renal function* 20%-25%. *Blood.* 70%-75%, leucocytes 6,400-16,800, polynuclears 20%-30%, unclassified 40%-42%. At the first examination the unclassified included large mononuclear-like cells with large blue staining nuclei and blue cytoplasm. At the second they were large cells with much fine granular cytoplasm taking more of the basophilic stain. The nuclei of these cells were irregular and some were lobulated—lymphoblast series. Reds 4,688,000-3,960,000, slight to moderate achromia. Platelets normal at the first examination, decreased at the last. *Report from Dr. G. R. Minot* February 14. "Blood smear shows immature large mononuclear cells, some certainly very immature from lymphatic tissue, others young normal large mononuclears. Clearly a pathological blood. Platelets normal and slightly increased. Any endocarditis? Infectious?" *Wassermann* negative. *Stools.* Guaiac negative at three examinations. *X-ray* February 12. Considerable motion in plate. Details rather indistinct. There was some increase in the shadow at the right lung root, and details in both apices were cloudy, suggesting a possible increase in density. The plate was not, however, satisfactory for the interpretation of lung details.

Orders. Until February 24 veronal gr. v and trional gr. x were given almost daily. On and after February 16 morphia gr. 1/8 to 1/6 was given almost daily once to every three hours p.r.n. February 11. Sodium bromid gr. xx b.i.d. Phenacetin gr. x, repeat once if necessary. February 13. Phenacetin gr. x with codeia gr. 1/2 by mouth. February 15 and 22. Codeia gr. 1/2. February 23. Boric ointment to arms p.r.n. Phenacetin gr. v by mouth. February 27. Zinc oxid wash* p.r.n. Salicylic acid ointment† to face p.r.n. Opium suppository gr. 1/2 p.r.n. one half hour before enema. February 29. Opium and gall ointment p.r.n. to hemorrhoids. March 3. Boric solution cleaning of eyes 2 i.d. with boric ointment to lids. March 8. Whiskey 3 ii in eggnog whenever patient can be made to drink.

February 10 the spleen was easily felt and the white count had increased from 6,400 at entrance to 16,800. There was a diffuse fine papular eruption over the body, especially on the arms. A skin consultant reported that this was purpura and he believed a part of the general condition. He advised no treatment.

The patient fell out of bed, striking his nose. A consultant found no recent fracture, but an old fracture which had produced a slight depression of the nasal bone and slight deviation of the septum.

February 18 two small fragments of fat containing clusters of small soft lymph nodes were removed from the neck for biopsy. February 21 the spleen and glands were much smaller. During the next four days the patient had a diffuse bright red eruption over the face, arms and body, associated with edema of the face. He was very weak and ate practically nothing. The skin was red and scaling all over his body. The edema of the face became somewhat less. The night of March 2 he had a chill with temperature 103°, pulse 120. His skin scaled profusely. His eyelids were red, and he was very uncomfortable. Three days later his skin had cleared remarkably. He was very weak, however, and

*Zinc oxid dr. ii, calamin dr. i, glycerin dr. ii, phenol minims xx, water to make ozs. viii.

†Salicylic acid gr. x, bismuth subnitrate dr. i, amyl dr. ii, oil of rose water oz. i.

losing weight, as he ate practically nothing and drank very little. March 11 he died.

Discussion

by Dr. Maurice Fremont-Smith

Notes on the History

He may have had a weak myocardium, but probably not, since he has been pretty well since his chronic cough. It may have been a chronic bronchitis. He may have had some mediastinal irritation.

His prostration, soreness, and temperature make one think of the possibility of trichiniasis, although he was hardly sick enough, and his temperature would probably have been higher. He had no edema about the eyes, and the blood smear would eliminate that diagnosis.

Notes on the Physical Examination

Such a more or less general glandular enlargement would make us think of Hodgkin's disease; possibly of the leukemias, possibly of syphilis. In Hodgkin's the cervical glands are enlarged first in a very large proportion of cases—over fifty per cent.—first on one side, then usually on the other. This is not necessarily the case however. The mediastinal or abdominal glands may be the first and only glands involved, and it is said the spleen may be the only lymph gland involved.

When there is doubt about the knee-jerks' being normal, it is important to test the ankle-jerks. Very often the ankle jerks will be normal, in which case the absence of one or both knee-jerks means probably nothing.

There is nothing in the urine to suggest renal insufficiency. A little albumin is no more than may be expected in a man of sixty-eight. The gravity is not low. It would be interesting to know whether the renal function was taken late, just before the man died, or when he first came in. It is undoubtedly low.

Miss Painter: It was taken February 14 and 16.

Dr. Fremont-Smith: That was five days after he came in. The low function may have been due then to the fact that he was showing marked debility, had been eating and drinking rather little since his admission, and that all the physical functions were at a low ebb.

The striking things about this blood smear as one looked at it were the large numbers of not excessively abnormal mononuclear cells. Most of the nuclei were lobulated. The cells did not suggest lymphoblasts and were certainly not the normal small lymphatic cell. The smear, looked at alone, suggested the disease which we call infectious mononucleosis, described first by Pfeiffer, by Tidy in England, and recently by Longcope here. This is an acute infectious disease, often occurring in epidemics, attacking the young rather than the old. The onset may be insidious or abrupt. Usually there is tenderness of the cervical glands on both sides, with some sore throat. There have been reported cases with acute abdominal pain. As the disease progresses there is general glandular enlargement, and the spleen becomes palpable in the second or third week. The liver is sometimes palpable. The disease runs a course of three to six weeks, and the temperature, which has been rising to 102° or 103°, disappears, and the patient recovers. There is no mortality. The glandular enlargement may remain afterward for some time.

Dr. William D. Smith: Are the cervical glands strikingly enlarged—more than the others?

Dr. Fremont-Smith: The cervical are the first, together with the submental glands.

The other possibilities from the blood smear are Hodgkin's disease and lymphatic leukemia or aleukemia.

Dr. Cabot: In this blood were there any cellular or other inclusions, i. e., showing phagocytosis?

Dr. Fremont-Smith: I saw none. The blood picture is rather remarkable for Hodgkin's at any stage. In an early Hodgkin's one might expect a rather high mononuclear count, ten or twelve per cent., with a comparatively low white count. Later the white count increases and the polymorphonuclears predominate, so that at last the picture is that of any septic condition.

The other possibility—lymphatic leukemia or aleukemic leukemia—must be considered. The cells do not look like the normal lymphocytes seen in the chronic leukemia, nor do they look like the lymphoblasts seen in the very acute lymphoid leukemias. And this man was not acutely sick enough at the beginning to make one feel that he had an acute lymphatic leukemia.

Dr. Minot brought up the question of an endocarditis. It is interesting that he felt this blood picture might occur in a subacute or chronic infection. Cases have been reported, I believe without glandular enlargement, in which there has been a high mononuclear count, usually lymphocytes, up to 80 or 90 per cent. in a chronic infectious disease or following such. I think in spite of the fact that a questionable diastolic murmur was heard, in a man of this age with a heart not enlarged we can exclude endocarditis. The temperature is not that of an endocarditis. It is a very extraordinary temperature. I think we should not find drops to below normal occurring for several days together in a bacterial endocarditis.

An Interne: Those drops are explained by a shift from rectal to mouth temperature at the request of the family. He was unable to keep his mouth closed.

Dr. Fremont-Smith: So that we cannot throw out on that ground an endocarditis.

Nevertheless I do not think we have evidence for it.

A more satisfactory X-ray plate might have helped us somewhat in the diagnosis. In Hodgkin's the hilus shadow is increased high up, and usually lobulated. There is no infiltration of the lung fields, in distinction to lymphosarcoma, in which there is frequently infiltration of the lung tissue. In tuberculosis we should have a streaking away from the hilus up into the lung toward the apices. In a typical Hodgkin's of the mediastinum there is a localized lobulated tumor high in the region of the bifurcation.

This skin condition is unusual. In Hodgkin's we find severe pruritus as a skin manifestation, and later brown pigmentation and occasionally granulomata. In the leukemias we get papules, pustules and nodules of leukemic tissue in the skin. And I believe that in leukemias a diffuse erythema followed by what appears to be an exfoliative dermatitis has been reported.

DIFFERENTIAL DIAGNOSIS

We have here either a Hodgkin's or one of the leukemias. Hodgkin's typically occurs in younger people. The blood picture apparently can be satisfactorily explained by neither, and must be one of the two. There are cases reported where Hodgkin's has suddenly been converted into a lymphatic leukemia. If such reports are accurate the pathology of this case would be very much simplified.

I believe we shall find Hodgkin's disease, with general glandular enlargement, enlargement of the spleen and liver, a normal heart, kidneys normal or showing evidence of the general arteriosclerosis, and no definite cause for death other than inanition.

DR. CABOT: I should like to say a word about this disease described as infectious mononucleosis. In 1913 I reported a group of cases of this kind.* I have never believed that it is an independent disease. I think it is a manifestation of infection, especially streptococcus infection, which for reasons entirely unknown to me manifests itself by mononuclear instead of by polynuclear increase.

The first case I saw, twenty or more years ago, was a case of dissecting-room infection of the arm in a physician. There was lymphocytosis, and we were scared to death, thinking he had a leukemia. His whites were about what are here described. He is living and well now. The next case I saw was a case of multiple boils with a very high lymphocyte count. Then I saw it in cases of ordinary tonsillitis, which I think is the commonest. But in some cases I think we have to say it is different from the ordinary in that axillary as well as cervical glands become involved. I have seen a lot of these lymphocytoses since, generally I think with streptococcus infection. And I do not see any reason for erecting a new disease entity there on the basis of the mononuclears.

I agree with the diagnosis that Dr. Fremont-Smith has given here, and do not see what else we can say.

DR. WILLIAM D. SMITH: In the history as written there it looks as though the spleen became enlarged after he got into the hospital. As a matter of fact his spleen was enlarged when he came in. I also was of the opinion that he had less enlargement of the liver than is shown in the record. I thought that he was probably a Hodgkin's with a queer blood. The temperature was a little bit of an imitation of the temperature that we get in the typical Pel-Ebstein fever. I should not have been surprised to find he had some blood disease, because his blood was atypical. But on the whole I thought he had malignant lymphoma.

DR. G. R. MINOT'S DIAGNOSIS FEBRUARY 14

Believe from the story a form of leukemia is the diagnosis—an aleukemic leukemia—a Hodgkin's of the aged.

BIOPSY FEBRUARY 17

Microscopic examination shows small and large atypical cells of the lymphocyte series, showing numerous mitotic figures. There is no fibrosis.

Malignant lymphoma.
H. F. HARTWELL.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Malignant lymphoma.

DR. MAURICE FREMONT-SMITH'S DIAGNOSIS

Malignant lymphoma.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

   Malignant lymphoma involving the bronchial and retroperitoneal lymph glands, the spleen, lungs, liver, kidneys, and small intestine.

2. *Secondary or terminal lesions*

   Abscess of the lung.
   Dermatitis.
   Arteriosclerosis.
   Slight hypertrophy and dilatation of the heart.
   Edema of the lungs.
   Leukoplakia of the esophagus.

3. *Historical landmarks*

   Chronic pleuritis.
   Slight hypertrophy of the prostate and trabeculae of the bladder.
   Cysts of right kidney.

*R. C. Cabot, The lymphocytosis of infection. Am. Jour. Med. Sci., Vol. CXLV, p. 335.

DR. RICHARDSON: The skin showed much scaling and desquamation generally. In the ileum, in fact in most of the lower half of the small intestine, the solitary follicles were hyperplastic, reddened, and in the lower part of the ileum there were small circular plaques, grayish-white, with some loss of their central portions; in other words, lymphoma of the intestine.

The retroperitoneal and bronchial glands were considerably enlarged and showed section surfaces like those found in malignant lymphoma.

The lungs in the region of the upper third of the upper lobes showed pigmented fibrosis with thickening of the pleura and septa, and were very firmly bound down in this region. There was a small abscess in one lung. Sections of the lungs in the region mentioned showed fibrosis and involvement by the lymphomatous new growth.

The heart weighed 308 grams, was slightly enlarged. The valves and myocardium were negative. The coronaries were free but showed a moderate amount of fibrous and fibrocalcareous change, as did the aorta and its great branches.

The liver weighed 1550 grams. The section surfaces showed some pale mottling, and microscopically there was some infiltration by the lymphocytic cells.

The kidneys weighed 290 grams. The sections showed in places small areas of atypical lymphoid tissue.

The spleen weighed 408 grams, moderately enlarged. The pulp was infiltrated by cells of the lymphocyte series. The marrow of the vertebrae was negative. The enlarged glands showed atypical lymphoid tissue.

There was slight enlargement of the so-called middle lobe of the prostate, but no definite obstruction of the urethra.

Culture from the heart blood was negative.

CASE 10203

An English-American clock maker of twenty-eight entered March 1.

F. H. His mother died insane, one brother of cause unknown to the patient.

P. H. Negative.

P. I. A year before admission he had a rather severe attack of generalized abdominal pain awakening him at midnight and lasting until the following noon, when a physician gave an enema with considerable relief. He was put on a liquid diet for a week, and during this week had no acute pain, but dull ache and soreness in the right lower quadrant. He had no more symptoms until a month before admission, when he again began to have in the right lower quadrant dull ache and soreness which had persisted.

A physician of the hospital staff adds this note: " . . . Has slight cough now. Would not give ether. Would watch a day or two."

P. E. Essentially negative except for very slight tenderness over McBurney's point.

Before operation *chart* and *urine* normal, *blood* not recorded except leucocytes 11,500.

March 3 operation was done. The patient had a slight cough after it, as he had at admission. March 4 there was some bloody sputum, and the temperature was 100°-105°, the pulse 89-130, the respiration 36. There were a few scattered râles and harsh breathing in the left chest. March 6 a portable X-ray showed marked increase in the left hilus shadow with mottling around its periphery extending well out in the midchest. (See illustration.) Next day there was frank bronchial breathing at the right base. The patient seemed to hold his own in spite of continued high temperature and pulse. March 8 a medical consultant reported, "Pleuritis on the left with friction rub in axilla; fairly large area of pneumonic consolidation in right back with classical signs. General condition fine, i. e., color, pulse and heart sounds. No indication for any drugs. Question of wide open window and cold air debatable. He might cough less if the air were warmer. Prognosis should be good. For nagging unproductive cough codeia p.r.n."

March 9 he seemed distinctly better and that night was comfortable. At midnight he suddenly became comatose, with many râles and much mucus in the bronchi. The pupils were small and contracted, although no morphia had been given since early afternoon. The patient was roused with difficulty. He was given caffein s.c. The next morning he quietly died.

DISCUSSION

BY DR. EDWARD L. YOUNG, JR.

A generalized abdominal pain severe enough to wake the patient up at midnight may be appendicitis, or may be just a "green-apple belly-ache," if you will, the general type of intestinal spasm from some irritant. If it was due to an acute inflammatory appendix it should not disappear following an enema. That is much more suggestive of intestinal spasm relieved by free evacuation. The fact however that he did have belly-ache and soreness in the right lower quadrant following that pain is suggestive that what he had was perhaps appendix colic, not an inflammatory appendix but a violent spasm to expel the contents. However, it is impossible to say with any definiteness exactly what that was.

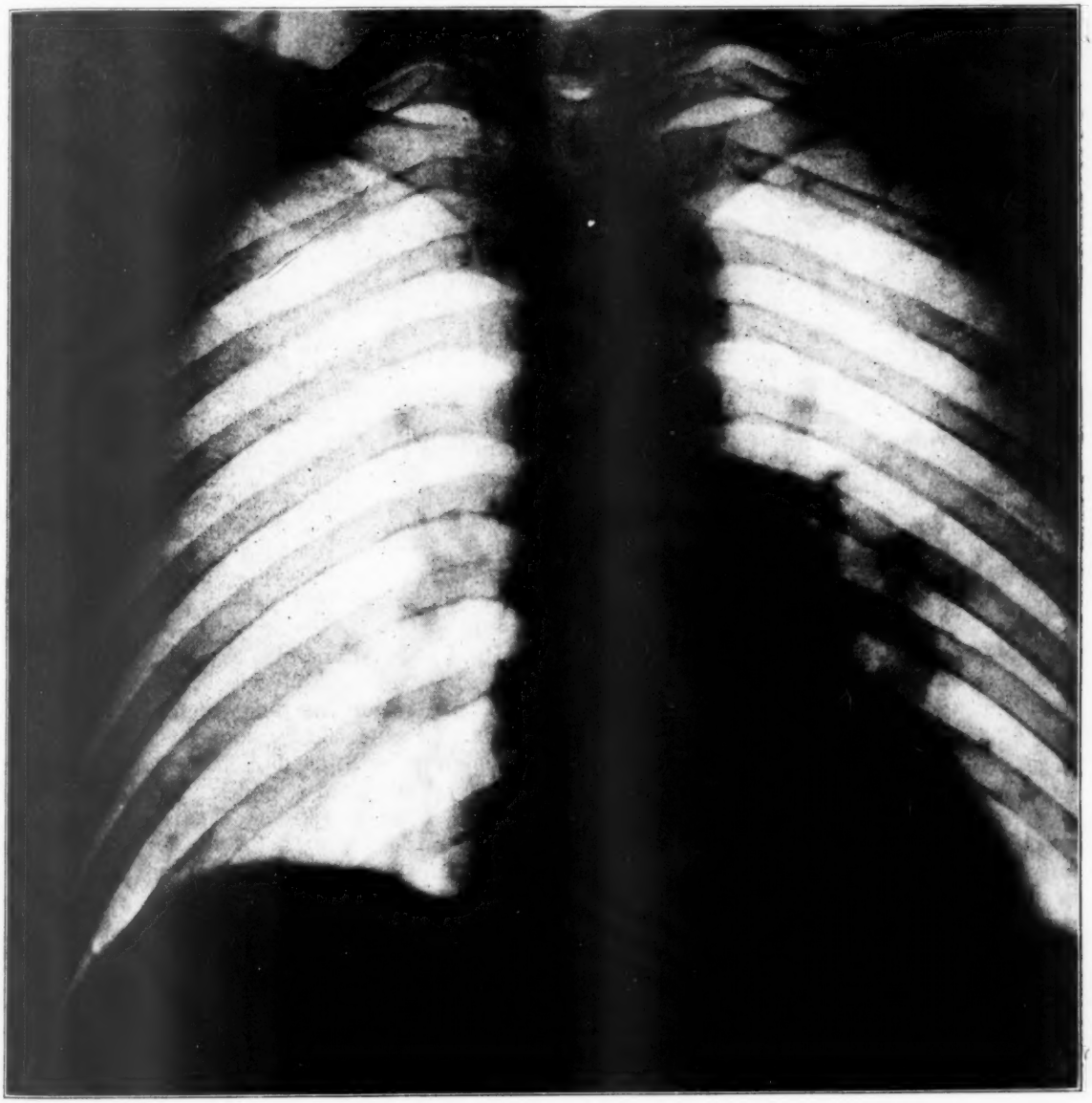
The physical examination is said to be essen-

tially negative, and yet someone in the next paragraph says, "Has slight cough now," and thought it was of enough importance to advise against giving ether.

This brings up the whole question of the risk of abdominal operation under varying conditions. Here is a man who has what may well be a mild appendix; it may not even be an inflammatory thing, but may be a long appendix which gets sore in an attempt to get rid of gas bubbles or bits of fecal material, or it may have nothing to do with the appendix. We have no evidence that there is anything which demands immediate operation. The record does not tell us whether the soreness has been enough to interfere with his work or his sleep. It has been enough to send him to the hospital. Before I operated on this man I think it would be fair to him to have an intestinal X-ray, at least a bismuth enema, and see whether the soreness was definitely due to a pressure over the appendix. In any event, if some person here thought that he ought not to have ether it seems as though it would be perfectly fair to let the patient wait until the risk of operation was entirely eliminated so far as the cough was concerned.

What else could he have that would be benefited by operation? The only thing I think of would be tuberculosis. Occasionally we find a tuberculous infection which starts in the appendix giving indefinite symptoms such as these. The other things which might make trouble would presumably make more than this before operation was demanded,—that is to say some urinary tract abnormality. So far as we know that was normal here, because the urine was normal.

If I had this operation now I think I should



Shows marked increase in the left hilus shadow with mottling around its periphery extending well out in the midchest.

go in under local after using plenty of morphia. I do not see but that recurrent subacute appendicitis is as good a diagnosis as we have any right to make on this story. We have very little to base a discussion on.

DR. J. A. C. MCLEAN: There is a little additional history to offer. The boy was an ex-service man who had been gassed, and he had a history of repeated attacks of intestinal colic in the right lower quadrant.

DR. YOUNG: More than this story gives?

DR. MCLEAN: Yes. He was a man who traveled, especially in the southern states, and that is why I recommended him to have the appendix out.

DR. YOUNG: I think that gives us quite a different slant on the story, because there are two factors of importance: one is the repeated attacks, which were as I understand more or less characteristic of appendix attacks, and the second is the fact that the man was out of touch with his own physician or with good surgeons because of his travels for different periods. So that it gives entire justification for going in and taking out the appendix in the interval, though a backward look would make us pay more attention to the cough.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Recurrent subacute appendicitis.

PRE-OPERATIVE DIAGNOSIS

Chronic appendicitis.

OPERATION

Gas and ether. Through a McBurney incision the peritoneum was opened without incident. There were firm palpable glands in the mesentery, probably tuberculous. The appendix was tied down at its tip and thickened, with many dense adhesions about it. It was removed by ligating the mesoappendix. The appendix was amputated with the cautery and the stump inverted. "This is a definite case of chronic appendicitis apparently accounting for the patient's symptoms."

PATHOLOGICAL REPORT

An appendix already opened. Its surface is covered with an inflammatory membrane. Its walls are thickened.

Chronic appendicitis.

H. F. HARTWELL.

FURTHER DISCUSSION

I wish they would call it *recurrent* or something else than *chronic*. Where I differ here is that it is a definite case of recurrent appendicitis showing the evidence of the acute attacks.

I should like to ask for a medical consultation to discuss this lung thing, especially with reference to the previous gassing which Dr. McLean speaks about.

DR. HOLMES: I think the amount of density at the root of the lung is distinctly greater than normal. Of course that might be a permanent thing as a result of lung infection or gassing, but it looks suggestive of beginning bronchopneumonia. The absence of any displacement of the heart or any abnormality in the position of the diaphragm would be against its being a collapse. There is not enough change in the periphery of the lung in any plate to make a diagnosis of tuberculosis. The dense glands might be tuberculous infection of the glands, only as far as the plate goes the only thing that would have any bearing on the case would be the bronchopneumonia.

DR. WILLIAM D. SMITH: I saw this patient. The case illustrates the utter foolishness of saying what a pneumonia patient is going to do. There did not seem to be any indication to give digitalis or anything else. The thing that bothered me was an obstinate and nagging cough. Therefore I made the note that the cold air was debatable. I think that cold air is undoubtedly a stimulant; but some of these patients who cough a great deal will cough less if the air is fresh but a little warmer. I do not know whether they changed that or whether it made any difference. It was cold in the room, and he was coughing a lot. I do not see why he should have died so suddenly, except that he had pneumonia.

DR. CABOT: The diagnosis was clear enough?

DR. SMITH: Absolutely. It was a large area of consolidation, perfectly definite signs.

DR. YOUNG: There is no mention made of pulmonary embolus, but such things have happened after operation. Dr. Cabot thinks pulmonary embolus cannot occur without cyanosis. I think I have seen it. I do not know whether that happened here or not, but patients can die like this with pneumonia.

DR. CABOT: Yes. As Dr. Smith says, we are never safe with any pneumonia. Do you think Dr. Richardson is going to find anything particularly interesting in the abdomen?

DR. YOUNG: The only question would be whether these glands at the root of the lung and the glands mentioned in the mediastinum were all tuberculous,—whether he will find any more evidence in the abdomen of tuberculosis. I do not see why he should find any more than is mentioned here.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Bronchopneumonia.
Chronic appendicitis.
Appendectomy.
Septicemia?

DR. EDWARD L. YOUNG'S DIAGNOSIS

Recurrent subacute appendicitis.
Bronchopneumonia.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesions*

(Recurrent subacute appendicitis.)

2. *Secondary or terminal lesions*

Operation wounds.
Pneumonia, lower lobe of right lung.

3. *Historical landmarks*

Obsolete tuberculosis of a mesenteric gland.

DR. RICHARDSON: The necropsy was made through the wound of operation, an opening three inches long. There was no peritonitis. The operation wound in the region of the appendix was in very good condition. The intestines on section were negative and the organs in the abdominal cavity as well as we could make out were negative.

The lung on the left side in the region of the lower third showed a frank pneumonia with pleuritis. The lung on the right side showed no pneumonia so far as I could reach.

The heart seemed normal to the touch. I could feel no enlarged glands in the region of the lung roots, and there seemed to be no good evidence in the pulmonary artery of any embolus. In the situation of the mesenteric glands there was one large stony hard gland. I found no evidence of tuberculosis anywhere else.

DR. YOUNG: There were not a lot of glands there?

DR. RICHARDSON: One.

DR. CABOT: I take it the moral you draw from this is, Pay some attention to what the physicians of the hospital staff say as to coughs and other conditions.

DR. YOUNG: I should. I suppose this chap probably wanted to go on another trip as soon as he could and they did not want to delay. But there is a certain mortality concerned with opening the peritoneal cavity under a general anesthetic. It may be small, and I think sometimes we forget that the giving of ether and opening of the cavity is in itself a major procedure. It is sometimes wise to stop and wait.

MEDICAL HISTORY

THE NECROPSY ON SAMUEL PEPYS

Mr. Editor:

It is well known that this superb chronicler of his times suffered from the stone. The following letter in the preface to his life, by Lord Braybrooke, is of interest.

"Mr. Jackson to Mr. Evelyn.

Clapham, May 28th, 1703
Friday night.

"Honoured Sir:

'Tis no small addition to my grief, to be obliged to interrupt the quiet of your happy recess, with the afflicting tidings of my Uncle Pepy's death: knowing how sensibly you will partake with me herein . . . . . .

"I must not omit acquainting you Sir, that upon opening his body, (which the uncommonness of his case required of us, for our own satisfaction as well as public good,) there was found in his left kidney a nest of no less than seven stones of the most irregular figure, your imagination can frame, and weighing together four ounces and a half, but all fast linked together and adhering to his back, whereby they solve his having felt no greater pains upon motion nor other ordinary symptoms of the stone. Some other lesser defects there also were in his body, proceeding from the same cause. But his stamina in general was marvellously strong, and not only supported him under the most exquisite pains, weeks beyond all expectations, but in the conclusion contended for nearly forty hours, (unassisted by any nourishment,) with the very agonies of death, some few minutes excepted, before his expiration, which was very calm.

There remains only for me, under this affliction, to beg the consolation and honour of succeeding to your patronage, for my Uncle's sake, and leave to number myself, with the same sincerity he ever did, among your greatest honourers, which I shall esteem as one of the most valuable parts of my inheritance from him, being also, with the faithfullest wishes of health and a happy long life to you,

Honoured Sir,
Your most obediant and
Most humble Servant,
J. Jackson."

In the famous "Diary" we note that Pepy's had been cut for the stone, and had suffered no discomfort afterwards, for seven years.

Yours truly,
WM. PEARCE COUES, M. D.

Brookline, April 29th, 1924.

MASS. ASSOCIATION OF BOARDS OF HEALTH

REGULAR Quarterly Meeting was held at 20th Century Club, Boston, April 24, 1924. Vice Pres. Dr. F. P. Denny presided in absence of Pres. Dr. E. L. Tobey.

Mr. Lythgoe presented and explained: "An Act Relative To Sanitary Food, So Called."

Dr. W. S. Rankin, Secretary No. Carolina State Board of Health and Field Director A. P. H. A., presented a paper entitled "The Significance of Standards in Public Health Work."

An admirable and most desirable plan, which received the hearty indorsement of all present, particularly of Dr. C. V. Chapin of Providence, R. I., and Dr. E. A. Kelley, Mass. Health Commissioner.

WM. H. ALLEN, M. D., *Secretary.*

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A DANGEROUS PRECEDENT

HEALTH COMMISSIONER MONAGHAN of the city of New York has issued an appeal that during the month of May every child in the city be given a thorough physical examination—a gigantic stock-taking of the health of this age group of the population. During this period various baby health stations and other organizations throughout the city *will place at the disposal of the public for this purpose the service of doctors and nurses.*

A widespread and continuous taking of stock of the health of all our population of all ages is a most desirable object. No group of citizens can be more desirous of preserving health than the medical profession, and the JOURNAL is heartily behind any sound method that will help to attain this object in a manner designed to promote the best interests of the nation for all time. There are certain questions that must be raised, however, and answered; there are certain facts that must be considered before Commissioner Monaghan's plan can be given complete endorsement.

Does the future well being of the population depend on an efficient and well trained medical profession? The answer must be in the affirmative. Can a profession progress continually forwards and upwards without the factor of a spirit of competition; a competition that brings with it the promise of the highest rewards for the greatest degree of success? Such progress without such competition is doubtful. The spirit of the profession can be preserved only by safeguarding the individual independence of its members, by answering to each one that his success need be measured only by his ability to secure it. This assurance can be given only by preserving for the physician his right to conduct his own practice, within legal and ethical limits, according to his own ability; and for the patient his right to seek medical advice according to his ability to select it and pay for it.

Commissioner Monaghan's plan to provide free physical examinations for all who may wish them is a step in the direction of state medicine, and state medicine will spell the doom of inspiration in medical work and of unlimited medical progress. Man has accomplished little without a definite incentive—the incentive to improve his intellectual, spiritual and physical condition. An attempt at the levelling of all men might be made, but if it were accomplished this level would be low—the valleys of mankind might be filled in, but they would be done so at the expense of the peaks.

Thomas Jefferson *believed* that all men were created free and equal; he made the mistake of so saying, and multitudes have believed him ever since. Men never were and never will be created equal. It is possible to create them legally free—they can never be created free from the handicap which nature imposes upon them—but, paradoxically enough, in the land of the free created in part by Jefferson there is perhaps as little freedom as exists in any civilized country, and what there is is being curtailed as rapidly as possible by representative law-making bodies. State medicine and free medicine are fundamentally opposed to freedom in its broadest sense; the freedom of achievement commensurate only to ability. In a land already burdened by the limitations set by a bureaucratic government, where one out of every forty has already been given the task of policing the other thirty-nine, let us at least be spared state medicine!

The idea of health examinations put forth by Commissioner Monaghan is a good one; we have long advocated it; but let it come about by education of the public to an appreciation of its benefits, so that they may ask it of the medical advisers whom they themselves select, and by education of the medical profession so that it will recommend it to the public whose confidence it enjoys.

COMMENT ON THE LETTER OF HENRY D. NUNN, COUNSELLOR AT LAW, 755 BOYLSTON STREET, BOSTON, OF APRIL 15, 1924, ADDRESSED TO THE EDITOR, BOSTON MEDICAL AND SURGICAL JOURNAL

MR. NUNN'S letter, taken with his previous communications as well as the pamphlets and other utterances of the organization of which he is manager, leads one to the conclusion that he is a greater stickler for effect than for fact. Furthermore, it is difficult to escape the feeling that his communications are made, partly at least, for home consumption by members of his league. Mr. Nunn appears to be a highly selective reader, at times choosing newspapers as his sources of information and at other times taking from their context any sentences or statements which he can use to bolster his argument. The members of the medical profession can not be expected to take seriously either the substance of his communication or the qualifications he possesses for setting himself up as a mentor on subjects relating to the practice of medicine or to the public health.

His letter, therefore, seems to call for no serious comment, yet it may not be an inopportune time to clear away any confusion that may exist concerning the effect of freezing upon diphtheria toxin-antitoxin mixtures, and the reasons underlying the choice of the various L plus mixtures of toxin-antitoxin. It has been definitely proven by careful experiments that prolonged exposure to temperatures below freezing may cause a toxin-antitoxin to become toxic, and that the toxicity is due to the setting free of toxin from the toxin-antitoxin combination. It is also apparent that this change depends upon a variety of factors, some of which are not known and some of which are still under investigation. The one-tenth L plus mixture, which is now almost universally used and which is being distributed by the State Department of Public Health, on account of its low toxin content, can not become sufficiently toxic to produce any harmful effects even though it be exposed to low temperatures for a long time.

After the introduction of toxin-antitoxin mixtures, the aim has been to produce a mixture which would contain a minimum of toxin and at the same time be efficacious in producing a high degree of immunity in the largest possible majority of persons treated. The orginal three L plus mixture proved to be a satisfactory immunizing agent but its use sometimes gave rise to some harmless but undesirable reactions in adults and children of the higher age groups. Park then introduced the one-tenth L plus mixture, but because his early reports showed that the percentage of those becoming immune after the three injections was slightly less than the number rendered immune by the three and one L plus mixtures, the manufacture and distribution of these last two mixtures was continued by many manufacturers and health departments. Later experiences with the one-tenth mixture now show that its immunizing power approximates that of the older mixtures, and it is now being everywhere adopted as the standard product for producing active immunization against diphtheria.

The Schick test and active immunization have won a high place in medical and public health practice. Family physicians, in rapidly increasing numbers, depend upon these measures to protect the children of their practices; school physicians and health officials, not only in this state but throughout the whole country, are protecting larger and larger juvenile groups. A susceptible child population is being transformed into an immune population, and it is not beyond the bounds of reason to expect, that by the more intensive and extensive use of active immunization, diphtheria will at no late day come under control.

THE DEATH DEALING FLY

SEVERAL years ago the Supreme Court of Maine held that a defendant in a suit brought by a hotel was justified in leaving the hotel because the plaintiff allowed flies to congregate on the defendant's table in such numbers as to cause insanitary and repulsive conditions

The indictment of the fly set forth that the fly is known to be annoying, repulsive and dangerous. It may disseminate germs of many diseases because of its filthy habits. The court found 136 bulletins and books printed in many languages, setting forth the dangers incident to the presence of flies.

We are so accustomed to the presence of these insects that we are apt to be indiffernt but it should be taught that typhoid and paratyphoid fever, tuberculosis, dysentery and intestinal diseases may be caused by flies acting as vehicles. In torrid countries the list of fly borne diseases would include others. The greatest number of victims are among children.

Boards of Health can not exterminate flies. Each individual must do his part. Remove the breeding places; trap, poison and swat these enemies of health. The complete cycle from the egg to the full grown fly requires only 10 to 14 days. The mature fly is a voracious eater.

Removal of decaying matter is the first step in prevention. We have fewer stables than formerly but we have garbage cans and accumulated waste vegetable matter which decays in warm weather. Keep the premises clean. Use screen doors and windows. Traps, sticky paper and poison paper can be utilized. A one per cent solution of formaldehyde is deadly to flies. Keep water and other liquids away from flies and they will drink the formaldehyde.

MISCELLANY

THE PROPOSED TUBERCULOSIS PREVENTION PROGRAM OF THE DEPARTMENT*

[Extract from the Annual Report of the Massachusetts Commissioner of Public Health for 1923.]

ALL members of this Department have followed with close interest for several years past the gradual development of the work which has been carried on by this Department in the field of detection, prevention, and cure of tuberculosis in children. This project was first conceived, formulated and developed under the stimulating leadership of Dr. Henry D. Chadwick, Superintendent of the Westfield State Sanatorium. The members of the executive staff generally, and especially the field force, have also cooperated earnestly in the development of this work. More recently the assistance of the medical staffs of the other sanatoria under the control of this Department has been utilized and during the past year physicians in charge of certain of the county and municipal tuberculosis institutions as well have actively participated in the work. The staffs of the various tuberculosis associations affiliated with the State Tuberculosis Association have also given invaluable and rapidly increasing assistance to it.

Hitherto all such work has been carried out on demonstrative and experimental basis, but as a result of these activities carried out on a very limited scale a program has gradually been evolved to be worked out on a State-wide scale and over a relatively long time basis—a period of ten years. This project has been explained in considerable detail to the members of the Commission on Administration and to the Legislative Committee on State Administration, which was charged in 1923 with the duty of investigating as a recess committee the tuberculosis hospitalization problem and reporting to the Legislature the best policy to be followed in reference thereto. After thoroughly studying the proposition, both of these bodies have given it their hearty support. In much less detailed fashion, but in broad outline, the proposed program has also been called to the attention of His Excellency, the Governor, and the presiding officers of the two branches of the Legislature, as well as to many individual members of the General Court. From all of these gentlemen encouraging endorsement of the program has been received.

The advice and constructive criticism of the medical profession generally and of tuberculosis specialists particularly have been sought in reference to the proposed program. Nearly all of those to whom the proposition has been clearly explained have endorsed it as feasible, although many practical difficulties have been pointed out. It is obvious that the difficulties will be great, particularly because the work is as yet so little understood by the general public, and still more because of the fact that the medical profession has not been trained to detect incipient juvenile tuberculosis. However, the consensus of opinion is that the plan is both feasible and economical.

The probabilities of wholesale reduction of the burden now imposed by tuberculosis through the carrying out of the plan proposed seem great. Therefore, there has been filed with the Governor an itemized budget for such a tuberculosis prevention campaign, based upon a ten-year plan of operation, aggregating for the whole period of time nearly half a million dollars and providing for the examination of 200,000 school children enrolled in the earlier grades of school for the purpose of forestalling or detecting tuberculosis in its earliest stages. In the initial year's operation approximately 10 per cent of the total estimated cost will be necessary.

A program of such magnitude must depend for its success upon the complete understanding by the medical and nursing professions and by the health and school authorities of the details of the proposal and upon the enlistment of their hearty co-operation in carrying out the plan, together with a sufficient although much less detailed comprehension of the plan on the part of the parents throughout the State, so that their interest and co-operation will also be assured.

It seems fitting at this time to make a brief statement of the reasons underlying our recommendations.

This new program proposes to put into effect on a broad State-wide scale, the knowledge gained during the last twenty years as the result of continuous study, and now universally accepted by the medical profession, as to the period of life in which tuberculosis usually first gains a firm foothold. When the present anti-tuberculosis program was being developed in this country, the greatest emphasis was naturally placed upon the obvious fact that consumption of the familiar type everywhere recognized was essentially a disease of adolescence and young adults. Hence, all the machinery for combating tuberculosis was directed against the prevention of adult infection and towards the provision of adequate hospital, dispensary, and home treatment of adult consumptives. But it has been conclusively shown in the last twenty years by the research of hundreds of workers the world over that there exist three distinct general types of the disease tuberculosis when the disease is considerd in relation to definite periods of human life. The first or the so-called infantile type of the disease found under two years of age is practically always in the nature of a general infection throughout the body and practically always fatal. The next type, the

*Read by Commissioner E. R. Kelley before the Health Institute for Nurses.

so-called juvenile type, found usually between 5 and 12 years of age, is the type or stage of the disease which shows a very low fatality. During this age period the disease is essentially one of the lymphatic glands and in the vast majority of cases is confined exclusively to these glands. The third and last is the adult type of tuberculosis. Here the disease has spread beyond the lymph glands and may attack any organ of the body and is most conspicuously found in the lungs, producing the familiar type known as consumption.

It is not to be understood that these age classifications are absolutely rigid. Any type of the disease may be found in any age period but general tuberculosis in adults is unusual and a tuberculosis process in an infant confined to the lungs alone is also very rare. Hence, for practical purposes the division just now roughly made fits the facts closely enough for proper procedure to be founded upon it.

When the whole question of human susceptibility to the tubercle bacillus is considered, it appears that the knowledge gained during the last two decades in reference to this subject has been of a two-fold character: first, that while exposure to tuberculous infection relatively early in life is almost universal, nevertheless out of the entire population almost three-fourths of all individuals seem to develop sufficient immunity to the tubercle bacillus to render them thereafter unsusceptible to the disease; and second, that the really "incipient" stage of tuberculosis is not what was formerly so designated in the first incomplete knowledge of the evolution of human tuberculosis, i. e., those adult cases of consumption which show only a small area of lung involvement. Today it is believed that whenever the disease has progressed to the point where it can be demonstrated in the lungs of an adult that that very fact shows that the disease is no longer incipient. Everyone, physician and public alike, need to get the new viewpoint in reference to this matter. It must be realized that tuberculosis in its true incipient or beginning stage is a disease of the lymphatic glands.

Fortunately, this period of what may be designated as the gland stage of tuberculosis represents the golden opportunity to overcome the disease if its real nature is apprehended and proper hygienic and hospital treatment instituted. This childhood period is the time in life when the powers of resistance can be most easily built up and when the tendency for tuberculosis to spread to other tissues is slightest. This age period is from 5 to 12 years.

Certain other facts essential to an understanding of the program now seem sufficiently well established to justify a certain amount of dogmatic statement based on established premises. These broad, general conclusions may be stated as follows:

A. Despite the splendid fight against the spread of the tubercle bacillus, tuberculosis invasion of the human body during early years of life is still almost universal and inescapable.

B. The factors that determine whether the infection is to produce disease or not are:

1. The existence in the individual affected of varying degrees of immunity.
2. The frequency, size, and virulence of the invading "dosage" of the tubercle bacilli.

C. The importance of cutting down the size and frequency of the dosage cannot be overstated. The greatest value of the whole tuberculosis campaign hitherto, from whatever standpoint it is considered, whether the campaign for protection of milk against bovine tubercle bacilli or human isolation measures or hygienic teaching of the best habits for the consumptive, has been due to the fact that these measures have all been in the nature of lessening the amount of infection.

D. Of those who escape the disease although exposed to the universal infection, the largest number by far do so by virtue of the process called immunity. About 70 per cent of the total population in this State can reasonably be classified as belonging to this group.

E. With the other 30 per cent of the whole population who do not possess this immunity, the prospect of many increasing their resistance sufficiently to prevent serious disease is still very bright. So far as it can now be determined, this result is directly in proportion to the extent to which repeated infections can be reduced or avoided and the extent to which the powers of bodily resistance to the tubercle bacilli can be increased during the all important period of early childhood.

F. The measures which the experience of the staff of this Department at the children's sanatorium at Westfield and which other workers have found successful in increasing resistance, once the problem of avoiding or greatly reducing re-infection has been disposed of, are very simple. They are essentially these: the maximum of fresh air and sunshine; careful regulation of the physical activities of the child; ample hours of sleep during the night; supplemented by carefully supervised naps or rest periods during the day; and most important of all, a thorough building up of the child's general nutrition.

Hence the practical proposition as a matter of proposed State policy is this:

Tuberculosis in adults is a very serious disease; it is very expensive for the patient, family, community and State, and although it is steadily and rapidly diminishing, it remains a very fatal disease, ranking among the chief causes of death.

Tuberculosis in adults represents in many instances at least an extension of a previously existing tuberculous process in childhood of a radically different type.

This glandular or childhood type of the disease is relatively easy to control. The evidence indicates that the later development of adult-pulmonary tuberculosis in these cases can be prevented if the childhood stage is recognized and appropriate treatment carried out before the lungs are actually involved.

The practical questions in reference to procedure are these:

Can the existence of this glandular or "hilum" type of tuberculosis occurring in childhood be recognized with a sufficient degree of accuracy to make it possible to select these children from the general mass of the childhood population?

Can these physical examinations be carried out on a wide-spread scale at a cost basis that will justify the State in making such an attempt?

I have become convinced as a result of the increasing experience of the Department in this field that the answer to both of these questions is most emphatically, "Yes!"

A brief history of the activities already carried out by the Department is pertinent here. Dr. Chadwick, as the result of his observations of children at the Westfield State Sanatorium, conceived the idea that it might be possible to detect cases of "hilum" tuberculosis by physical examination before symptoms were sufficiently obvious to lead the parents to consult their family physician. Being at this time impressed by the prevailing, although not universal, tendency of the children admitted to the institution to fall below the average standards of development and nutrition, he proposed to the superintendent of the Westfield public schools that a thorough examination for the presence of hilum tuberculosis be made of a group of school children falling markedly below the average standards of weight and height, together with the group of children known to have been directly exposed to pulmonary tuberculosis in their homes. This work was carried out very thoroughly. Interesting and, when looked at from all angles, highly encouraging results came from this study. But fearing lest erroneous conclusions might be drawn if too much stress was placed on the findings in a single community, this Department through its field force of physicians and nurses and the staffs of the sanatoria, later assisted greatly by staffs of other institutions, has for the last three years carried out a series of similar examinations all over the length and breadth of Massachusetts In all, some 89 communities have been studied in this manner and a total of 126 clinics held at which five thousand school children have been examined.

To recapitulate, this work, carried on throughout the State for the past three years, has been directed to the examination of certain elected groups of school children:

A. Children who were 10 per cent or more below the accepted standard of height and weight, and for age.

B. Contact cases—those who were known to have been exposed to tuberculosis in their homes.

C. A much smaller group not coming under either of the above classifications but whose physical condition was considered unsatisfactory by the teachers or family physician.

As a result of these examinations, the following conclusions can be drawn:

The evidence shows that 15 per cent of the children in the schools of Massachusetts between the ages of 5 and 12 years will be found to come within one of the three groups just mentioned. There will be some variations in this percentage in different communities but the average will be closely maintained in different sections of the State. Applying these figures to the total school enrollment in this age group gives in round numbers *at the present time* 110,000 school children who need to be examined, diagnosed, classified, and appropriate treatment instituted for the benefit of those found to be in need of it.

The next significant point is that when this group is thoroughly examined by sanatorium physicians expert in the difficult field of detecting hilum or juvenile tuberculosis, and when the doubtful cases are checked by subsequent X-ray examination of the chest, and in some instances by the tuberculin test as well, it will be found based on past experience that about 8 per cent of this group will show signs and symptoms sufficient to justify a positive diagnosis of "hilum" tuberculosis. Everyone in this Department today is, I believe, thoroughly convinced that this same group if neglected will furnish the great bulk of adult consumptives 10 or 15 years hence, and on the other hand that a very high percentage of all these children can be speedily and permanently cured if adequately treated while yet in the glandular stage of the disease.

This would indicate that there are approximately 8,500 to 9,000 children enrolled in the schools of Massachusetts, not as yet diagnosed by anyone as suffering from the juvenile type of tuberculosis, who ought to be found, placed under good hygienic conditions, and their nutrition improved before they reach the critical age of adolescence. That is the time when the disease if unchecked will assume the much more serious and fatal adult form.

For various reasons which it is not necessary to state in detail here, it is also probable that only about 1 per cent of the total group selected

out of the whole school population for special examination needs to be considered as prospective candidates for sanatorium treatment. If this conclusion is correct, undoubtedly there are beds enough at the present time in the various State sanatoria to provide for all the children needing prolonged sanatorium care, it being assumed that there will be a continuous increase in the number of beds available because of the decreasing demand in the coming years for the care of adult cases. It is also obvious that bed provision for children will be very greatly increased by the provisions already made by some of the larger municipalities, notably Boston and New Bedford. It seems quite clear, however, that aside from the largest municipaliites the most practicable way of furnishing sanatorium care to this group of children is through the State, because these children in a great majority of cases can soon be put in such physical condition that they will actually benefit by a short, regular school period each day, and there would not be a sufficiently large group in most of the local institutions to justify the maintenance of a complete school system.

There will also be found, based on the experience of this Department thus far, a much larger group, approximately 27 per cent of the total group selected for examination, who will have to be classified as either "suspicious" of beginning "hilum" tuberculosis or as showing such a marked deviation from normal nutrition and physique for their age that they should be under special supervision and attention. This group plus the considerable number of children who will be found and definitely diagnosed as suffering from active hilum tuberculosis, but whose general condition, home surroundings, prospects for intelligent home care and supervision of nutrition, are so good that they do not need special sanatorium care, represents a problem of treatment for which the responsibility must be left to the individual families and communities.

The following statements summarize the proper disposition of positive and "suspicious" cases found in clinics:

The "positive sputum" cases and all others which exhibit pronounced signs and symptoms of active disease should have sanatorium care. The group to be supervised without hospitalization will consist of the other cases where a positive diagnosis has been made based on signs and symptoms showing the latent and more chronic type of disease. These children will do well under home treatment provided home conditions are fairly good and the parents intelligent and co-operative.

There must also be considered the much larger group of cases that can only be termed suspicious which must have the same type of supervision. The children in this category are borderline cases where a definite diagnosis is not justified but who are destined in many instances to become definitely tuberculous if help is not promptly given. Ninety-five per cent of them are infected with tuberculosis and in their state of mal-nutrition will become easy prey to the disease. This group of children must be followed up and taught correct health habits, good hygiene, and later be periodically re-examined. Even under this régime, a small number of these cases will be found to have made no improvement and they should be sent to a sanatorium.

The following statement is a reasonable forecast of the results that may be obtained by carrying out the program outlined above:

1. Cases of active and latent tuberculosis will be discovered at an early stage and treatment instituted at a time most favorable for arrest and cure of the disease.

2. The number of cases of mal-nutrition will be greatly reduced and by doing this the susceptibility of such children to tuberculosis and other infectious diseases will be lessened to a marked degree.

3. The clinics will lead to the discovery of other physical defects that impair health and thus give opportunity for the correction of such defects.

4. Because of a higher standard of health there will be a substantial decline in the number of retarded children that now have to repeat their grades in school.

5. Mortality from tuberculosis will decline rapidly because by this program cases of tuberculosis will be prevented from developing into bacilli spreaders and infection thereby lessened, and at the same time the resistance in the whole group of school children will be so increased that when they reach adolescence and young adult life they are much less apt to develop the pulmonary type of the disease.

The means at hand for attacking the problem:

Money is the first requisite but money is far from solving the problem of creating an efficient organization to grapple with the situation.

The most difficult problem of all is that of collecting a personnel sufficiently trained in the work of diagnosing "hilum" tuberculosis. Diagnosis is not easy and the subject has been singularly neglected both by the pediatrist and the tuberculosis specialist whose work is practically all confined to adult manifestations of the disease.

It is largely on account of the need of developing and training such an expert force that a progressive plan of action is recommended by which the maximum number of diagnosticians required will not be reached until the third year of the program.

There are now available for this work, for a portion of their time only, however, the medical staffs of the sanatoria and the State Infirmary, the medical staffs of the county sanatoria, and of a few municipal institutions provided with

resident, full-time medical officers. There is also available to a variable but everywhere limited extent the expert assistance of the municipal tuberculosis dispensary physicians.

There are available in addition for a part of their time the services of the seven district health officers and nursing staff of the Department and of the tuberculosis nurses of the various municipalities. Inasmuch as these nurses must also keep under supervision several thousands of adult consumptives, the time which they can give to the special examination work is of necessity limited.

The field nursing force of many of the tuberculosis associations are available for assistance in the program, some of them on practically a full-time basis. The co-operation of these workers, already actively enlisted, is the equivalent of a considerable appropriation for additional personnel from State or counties or municipalities.

Other agencies available and whose co-operation is necessary for the success of the project are:

1. The family physician, to whom all positive and suspicious cases should be referred.

2. The local boards of health with their dispensary and nursing staffs.

3. The school departments, with their physicians, nurses and nutritionists.

4. Summer camps and preventoria supported by municipalities and neighborhood agencies.

5. Another valuable adjunct is the teaching of health and health habits, particularly nutrition, in the schools, not as an added course of study but by incorporating health and hygiene into the daily lessons of reading, writing and arithmetic. This has been done for six years in the schools of Newton with most excellent results and the same idea is developed by the well-known National Health Crusade movement.

The immediate personnel additions which the program calls for are five full-time physicians, one to serve as general supervisor and director of the entire program immediately under the Director of the Tuberculosis Division of the Department, and one each added to the present staffs of the four sanatoria for the express purpose of school clinic examination work.

It is proposed to expand this staff to a maximum of twelve by the third year in order to provide adequate machinery for examination of all the children in this age period considered: thereafter to reduce the number of personnel as only children of the first grades plus re-examinations will need to be covered.

The program also calls for a staff of nurses, eight in number for the first year, who will devote their entire time to the work, and for four nutrition experts for the first year whose duties will be the instruction of mothers as to nutrition of the group of "suspects" and "positives" not going to sanatoria.

An additional clerical force will also be required.

The services of county and local sanatoria staffs, of municipal tuberculosis dispensary physicians and nurses, local board of health staffs, both medical and nursing and laboratory, and of school physicians and nurses can all be counted upon to a considerable extent in the examination program, but it is perhaps wise to emphasize that not too much should be asked, for the most essential feature of the success of this plan is our reliance upon the local officials, workers, city governments, and local tuberculosis and other child welfare organizations, assuming the responsibility for the great problem of local special care at home or in the community. About 200,000 children will have been examined if the program is carried out over a ten-year period. About 2,000, possibly 3,000 or even more, will have had the benefit of sanatorium treatment in that time. But at all events, a much larger group of "positives" and practically all the "suspicious" and those found seriously under-nourished but without definite tuberculous indications must depend for special care upon the general community, government, child welfare agencies, parents and school authorities. This number may be variously estimated as ranging from 8,000 to 10,000 needing definite anti-tuberculosis or tuberculosis prevention care as exemplified by the measures elsewhere outlined, up to possibly continuously 15,000 to 25,000 others needing less intensive care, principally home advice to mothers relative to nutrition supplemented by instruction in hygiene in the schools.

THIS IS CLEAN UP TIME

DIRT has been defined as "matter out of place." This is the time of year when there is always a great deal of matter out of place in our back yards and about our places. The snow and the cold weather have caused us to neglect outside work, and the result has been the inevitable accumulation of rubbish, which should now be cleaned up.

This is partly a health matter, for if we do not clean up there are sure to be tin cans and other receptacles to hold water in which mosquitoes will breed, decomposing material in which flies will deposit their eggs, or food and shelter for the dangerous rat. It is partly also a civic duty, for on the care that the individual citizens take of their places depends largely the attractiveness of the town as a place of residence.

Therefore everyone take hold at this time and clean up his place and help make Brookline the most healthy and attractive town in the country.—*Brookline Board of Health Bulletin.*

HEALTH DEPARTMENT MONTHLY BULLETIN

THE Monthly Bulletin of the Health Department of the city of Boston is a publication that is well worth the attention of physicians practicing in this vicinity, as well as of lay readers who are interested in the public health, and the latter should be of ever increasing numbers. The milk report alone should be most carefully studied as furnishing the only indication we have at present of the quality of this product coming into Boston.

"Diabetes and Insulin" by Dr. Elliott P. Joslin, in the April number, is a short discussion of unusual, although not of unexpected, merit. The information contained is interestingly, clearly and simply set forth, including, in a few papers, essential facts concerning statistics, diagnosis, prevention and treatment. The special subjects which Dr. Joslin enlarges upon are the prevention of diabetes in Boston. The needless deaths from diabetes in Boston, the diet in diabetes, the new treatment of diabetes with insulin and dogs and diabetes.

It is not encouraging to note that there are a million individuals in the United States who have or will have diabetes, nor that in Boston and New York one out of every fifty deaths is due to diabetes. Modern methods of treatment, however, may induce us to consider this, with Dr. Joslin, the "best of chrouic diseases." The history of insulin is told, and we are apprised of the fact that the quantity of insulin used in Boston and vicinity is 90 per cent. above the average for the rest of the United States.

FIRST LEPERS FOR NEW ADDITIONAL BUILDINGS AT CARVILLE, LOUISIANA

"THE first of the additional buildings provided by Congressional Act of February 20, 1923, to enlarge the National Leper Home at Carville, Louisiana, have been completed and twelve lepers who had been temporarily detained elsewhere were moved to Carville, April 4," Surgeon General Cummings of the U. S. Public Health Service stated recently.

"The additional buildings, all of which are under construction, will be rapidly made available for patients in the order of their completion and it is believed that they will be fully occupied within a few months. The appropriation, amounting to $650,000, provides additional beds for approximately 240 patients and increases the present capacity of the institution to more than 400. The Home will, however, still lack a hospital building proper for the care of the blind, crippled, tuberculous, insane and other classes of patients requiring nursing and highly specialized care. The need for a therapy building where instruction may be given in arts and crafts and other diversional employment is also felt by the patients of both sexes, who necessarily require some employment or amusement in this place where they are confined for life or until they recover."

REPORT OF ANNUAL MEETING OF THE MIDDLESEX NORTH MEDICAL SOCIETY

THE Middlesex North Medical Society held its annual meeting on Wednesday, April 30th, at the Lowell General Hospital. At the business meeting, the following were elected as officers of the Society for the ensuing year:—

President—A. R. Gardner.
Vice-President—John F. Boyle.
Treasurer—E. J. Clark.
Secretary—T. A. Stamas.
Librarian—P. J. Meehan.
Commissioner of Trials—F. E. Varney.
District Nomination Committee—Principal, J. B. O'Connor; Alternate, T. F. Carroll.
Censors—J. H. Lambert, Supervisor; E. J. Clark, M. A. Tighe, J. A. Gage, G. A. Lavallee.
Councilors—W. B. Jackson, J. H. Lambert, J. A. Mehan, J. B. O'Connor, T. F. Carroll, T. A. Stamas.

A clinical meeting was arranged by the staff of the hospital, which consisted of the following:—

Presentation of Diabetic Coma, Treated with Insulin, Dr. Howard Jewett.
Interesting Medical Case for Diagnosis, Dr. F. Leon Gage.
(Discussed by Dr. Frothingham of Peter Bent Brigham Hospital)
Intestinal Obstruction, Dr. G. Forrest Martin.
Lesion about Pylorus, Dr. J. Arthur Gage.
Gall Bladder, Dr. Archibald Gardner.
Congenital Dislocation of Hip, Dr. John Lambert.

Following the clinical meeting, dinner was served, and the President of the parent society, Dr. Bigelow, gave a very interesting talk on the general development of the Society.

The meeting was concluded by several short talks by the older members.

PUBLIC MEETING IN EAST BOSTON

A PUBLIC meeting was held in the East Boston High School on the evening of April 25 under the auspices of the Massachusetts Medical Society, the subject being The Control of Diphtheria by the Use of the Schick Test and Toxin-Antitoxin. Dr. James S. Stone, of the Committee on Public Instruction, presided and presented the speakers.

Dr. Hans Zinsser, professor of bacteriology in the Harvard Medical School, explained the production of anti-toxin in the horse, its use in the treatment of diphtheria, and the mechanism of

the Schick Test and toxin-antitoxin mixture in the prevention of the disease.

Dr. Benjamin White, director of the State Antitoxin and Vaccine Laboratory, spoke next on the work that is going on in the laboratory and discussed statistics of susceptibility as shown by the Schick Test and the success of toxin-antitoxin in reducing this susceptibility.

Dr. Edwin H. Place, chief of the South Department of the Boston City Hospital, demonstrated that the death rate from diphtheria since the introduction of antitoxin has fallen to one-tenth of what it was previously. The death rate, however, is still inexcusably high because diphtheria is insidious in its onset, and antitoxin is of greatest effectiveness only when given early and in sufficient amounts. The only way to stamp out this disease is to render children immune, and this we know we can accomplish, and without risk to the child. Since immunization began, diphtheria has practically ceased among doctors and nurses.

Dr. John A. Ceconi, of the Boston Health Department, next explained the work that is being done by the Department in the control of diphtheria. 88 per cent. of the susceptible children in the private and parochial schools of Boston have already been immunized. A plea was made that the parents of public school children allow and insist upon having their children tested and immunized.

The meeting was not largely attended. This fact, however, instead of being a discouraging one, should serve to emphasize the need of work in public instruction. The Society has set itself the task; the work must be continued.

THE MASSACHUSETTS TUBERCULOSIS LEAGUE

OFFICERS ELECTED AT ANNUAL MEETING APRIL 25, 1924

President, Dr. Edward O. Otis.

Vice-President, Dr. Kendall Emerson.

Honorary Vice Presidents, Vincent Y. Bowditch, M. D., Eugene R. Kelley, M. D., Cardinal O'Connell.

Treasurer, Arthur Drinkwater.

Assistant Treasurer, Romney Spring.

Clerk, Robert V. Spencer.

Executive Committee, Dr. Francis P. Denny, Miss Louisa P. Loring, Dr. Parker M. Cort, Rev. Walter F. Greenman, Dr. Sumner H. Remick, Dr. Roger I. Lee and the officers.

NEW ENGLAND HEALTH INSTITUTE

THE New England Health Institute has come and gone. Under the leadership of Dr. E. R. Kelley, State Commissioner of Public Health, who served as Director for the Institute this year, 1200 people gathered together from all parts of New England for the purpose of studying problems of public health and have returned to their practice or to their organization with new ideas and inspiration. Eighty-five lectures were scheduled at the Institute covering all the major phases of public health work. These were grouped into thirteen sections:

1 Public Health Administration
2 Preventable Diseases
3 Sanitation and Engineering
4 Tuberculosis
5 Venereal Diseases
6 Child Hygiene
7 Public Health Nursing
8 Social Work
9 Mental Hygiene
10 Industrial Hygiene
11 Foods and Food Control
12 Nutrition
13 Health Education

The faculty was made up of representatives from the leading official and private organizations in this part of the country, together with certain distinguished guests from more distant places. The sponsors for the Institute included not only the Massachusetts Department of Public Health, but also the State Departments of Health of the other New England States; the Schools of Public Health of Harvard and Yale; the Departments of Biology and Public Health of Simmons and Technology; and also the Federal Public Health Service.

The registration of over 1200 was very gratifying and included not only physicians, nurses, dentists, social workers, teachers, and lay representatives of various associations having public health as one of their objectives, but also students from the schools of public health and other institutions with allied interests. Several of the schools shut down almost entirely in order to allow the students to attend the Institute. Teachers in some of the towns were also excused early in order that they might come. As there were three meetings scheduled simultaneously the maximum attendance at any single lecture was approximately 550.

It would be invidious to attempt to pick out any one group of lectures over any other group because of the general excellence of them all. One might refer however to one general meeting which was held under the joint auspices of the Institute and the Massachusetts Dental Association. The speakers at this meeting were Dr. Thaddeus P. Hyatt of New York, who discussed the Economic Value of Mouth Hygiene, and Professor of C. E. A. Winslow of Yale, who took for his subject Some Unsolved Problems of Public Health.

While much that was said and exhibited was the grouping of established facts and opinions the great value consisted in projecting into the minds of those occupied in health work information only partly appreciated hitherto or imperfectly correlated. The progress of public

health knowledge and practice has been exceedingly rapid in the last decade and the multiplicity of agencies all striving to secure endorsement and support has created some confusion in the average mind so that attendance upon these meetings will give to those who have been present much clearer ideas concerning preventive measures and the functions of the various boards and departments.

As one went about in the several halls the evidence of serious attention, and the large numbers of busy pencils gave assurance of the dissemination of useful information to communities far and near.

The quality of the addresses was uniformly excellent for leaders in the various fields of health work had been secured and the teaching was logical, direct and systematic. The wide range of subjects covered all phases and it was possible for each delegate to find the particular instruction which might be desired.

Although the meetings will be productive of great good in so far as those in attendance will carry back the knowledge imparted and enthusiasm developed by the speakers it is to be regretted that more physicians have not availed themselves of the opportunities offered, for it is recognized and generally proclaimed by health workers that the greater progress must come in the future in the closer association of the practitioner of medicine and public health agencies. Indeed it has been logically argued that each physician's office must be regarded as a health center and until this is brought about the official bodies are working under very apparent difficulties.

The plan of the Institute involves a rotation of the meeting place among the New England states. At the annual business meeting, held Thursday, it was decided that the invitation of Maine be accepted and consequently Dr. Kendall, Health Commissioner of Maine, was elected Director of the 1925 session of the Institute.

THE MASSACHUSETTS MEDICAL SOCIETY

THE *program* of the *One Hundred and Forty-Third Anniversary of the Massachusetts Medical Society,* to be held at the New Ocean House Hotel, Swampscott, is as follows:

Friday, June 6,

Morning: Registration

11.30 A. M. Annual Meeting of the Supervising Censors.
12.00 Noon. Annual Meeting of the Council. Followed by the Cotting Lunch.
2.00 P. M. Meeting of the Section of Medicine.
2.00 P. M. Meeting of the Section of Hospital Administration.
2.00 P. M. Meeting of the Section of Obstetrics and Gynecology.
6.00 P. M. Informal Dinner at the Hotel.
8.00 P. M. The Shattuck Lecture. After the Lecture there will be a Cabaret Supper and dancing until 11.30 P. M.

Saturday, June 7,

9.30 A. M. Meeting of the Section of Tuberculosis.
9.30 A. M. Meeting of the Section of Pediatrics.
9.30 A. M. Meeting of the Section of Surgery.
12.00 Noon. Annual Meeting of the Society.
1.00 P. M. The Annual Discourse.
2.00 P. M. The Annual Dinner.

The complete program, giving the titles of the papers and the names of the speakers, has already been mailed to the Fellows by the Secretary. All Fellows are requested to fill in and return the enclosed postcard regarding reservations as early as possible.

COMMITTEE OF ARRANGEMENTS

THE REVOCATION OF TWO CERTIFICATES OF REGISTRATION

ON May 2, 1924, the Massachusetts Board of Registration in Medicine revoked the certificate of registration of Dr. Daniel W. Dorman on complaint alleging violation of the laws relating to the use and prescribing of narcotic drugs.

On the same day the certificate of registration of Dr. John Therrien was revoked and cancelled for one year. At the hearing Dr. Therrien testified that he introduced a sound and later an irrigating tube into the uterus of a young woman for the purpose of relieving dysmenorrhea. The patient developed peritonitis and a subsequent operation by an expert surgeon revealed a puncture of the uterus. The methods employed by Dr. Therrien seemed to indicate to the board lack of adequate judgment and skill. The patient died.

RESUME OF COMMUNICABLE DISEASES

March, 1924

GENERAL PREVALENCE

The prevalent diseases showing an increase over the previous month were as follows:

	March 1924	February 1924	March 1923
Measles	4,052	3,553	3,609
Mumps	1,779	1,410	1,188
Pneumonia, lobar	556	546	790
Scarlet fever	2,103	2,076	1,566

RARE DISEASES

Anterior poliomyelitis was reported from Boston, 1; Everett, 1; Gardner, 1; Lawrence, 1; Lowell, 1; Lynn, 1; Northampton, 1; Reading, 1; Webster, 1; total, 9.

Dog-bite requiring anti-rabic treatment was reported from Arlington, 4; Belmont, 1; Boston, 14; Lowell, 10; Somerset, 1; Somerville, 2; Waltham, 1; Winthrop, 1; total, 34.

Encephalitis lethargica was reported from Boston, 3; Cheshire, 1; Chicopee, 1; Milford, 1; Milton, 1; North Attleboro, 1; total, 8.

Epidemic cerebrospinal meningitis was reported from Amesbury, 1; Boston, 3; Fall River, 1; Hudson,

1; Lawrence, 1; Lowell, 1; Lynn, 1; New Bedford, 1; Orange, 1; Worcester, 1; total, 12.

Malaria was reported from Brockton, 1.

Septic sore throat was reported from Boston, 9; Dover, 11; Fairhaven, 1; Fall River, 1; Gill, 19; Milton, 2; Needham, 1; Salem, 1; West Springfield, 2; Worcester, 1; total, 48.

Smallpox was reported from Taunton, 1.

Tetanus was reported from Boston, 1; New Bedford, 1; Worcester, 1; total, 3.

Trachoma was reported from Boston, 4.

Trichinosis was reported from Boston, 1.

DISTRIBUTION

All Communicable Diseases

	March 1924	March 1923
Total cases (all causes)	12,554	12,140
Case rate per 100,000 population	313.6	305.8

Certain Prevalent Diseases

Diphtheria:	March 1924	March 1923
Total cases	648	698
Case rate per 100,000 population	16.2	17.6

Cities and towns noticeably exceeding their median endemic indexes*:

Brockton	(16)	26	Winthrop	(1)	6
Amesbury	(1)	4	Worcester	(20)	49
Haverhill	(11)	20	Ware	(0)	4

Measles:	March 1924	March 1923
Total cases	4,052	3,609
Case rate per 100,000 population	101.2	90.9

Cities and towns noticeably exceeding their median endemic indexes*:

Bourne	(0)	12	Somerville	(24)	55
Chatham	(1)	11	Waltham	(2)	207
Plymouth	(0)	40	Hardwick	(0)	11
Boston	(531)	828	Lancaster	(1)	31
Brookline	(17)	120	Lunenburg	(0)	13
Millis	(0)	22	Northboro	(0)	18
Milton	(5)	99	Webster	(0)	50
Newton	(12)	195	Chicopee	(0)	87
Quincy	(16)	105	Easthampton	(0)	31
Beverly	(2)	106	Holyoke	(7)	51
Gloucester	(0)	32	Northampton	(5)	125
Marblehead	(0)	12	Palmer	(3)	16
Stoneham	(1)	39	South Hadley	(1)	10
Swampscott	(1)	7	Springfield	(36)	422
Arlington	(8)	21	Williamsburg	(0)	38
Ayer	(0)	39	Dalton	(0)	7
Billerica	(2)	42	Greenfield	(1)	159
Lawrence	(18)	54	North Adams	(0)	92

Scarlet fever:	March 1924	March 1923
Total cases	2,103	1,566
Case rate per 100,000 population	52.5	39.5

Cities and towns noticeably exceeding their median endemic indexes*:

Fall River	(17)	60	Hudson	(0)	9
Mansfield	(1)	9	Lexington	(1)	8
Provincetown	(0)	7	Medford	(13)	39
Boston	(231)	534	Somerville	(28)	83
Brockton	(13)	39	Waltham	(9)	24
Cambridge	(30)	83	Watertown	(3)	45
Beverly	(3)	18	Winchester	(2)	9
Everett	(15)	29	Fitchburg	(2)	103
Malden	(16)	53	Leominster	(5)	95
Melrose	(8)	25	Worcester	(46)	103
Peabody	(4)	14	Springfield	(28)	100
Winthrop	(5)	16	Westfield	(2)	17
Arlington	(4)	10	Pittsfield	(10)	37
Belmont	(3)	11			

Typhoid fever:	March 1924	March 1923
Total cases	24	41
Case rate per 100,000 population	.6	1.0

Whooping cough:	March 1924	March 1923
Total cases	422	1,883
Case rate per 100,000 population	10.5	47.4

Cities and towns noticeably exceeding their median endemic indexes*:

Dartmouth	(0)	19	Wrentham	(0)	6
Fall River	(18)	40	Lynn	(12)	32
New Bedford	(6)	18	Pepperell	(0)	21
Wellesley	(2)	8	Worcester	(15)	36

Tuberculosis, pulmonary:	March 1924	March 1923
Total cases	556	425
Case rate per 100,000 population	13.9	10.7

Tuberculosis, other forms:	March 1924	March 1923
Total cases	93	65
Case rate per 100,000 population	2.3	1.6

*The Median Endemix Index is obtained by arranging in arithmetical sequence the monthly totals of reported cases for the past five years and selecting the middle figure. The numbers in parentheses after the name of each city and town indicate the median endemic index for that city or town; the numbers without parentheses indicate the cases reported during the current month.

NEWS ITEMS

MEDICAL HONOURS.—Our contemporary *The Japan Medical World* records that Dr. Kitasato, of the Institute for Infectious Diseases which bears his name, has been created Baron by the Emperor in recognition of his services to his country. The world-famous bacteriologist is the Dean of the Medical College of Keio University, and the first physician not connected with the government to be so honoured.—*The Medical Press.*

BOSTON CITY HOSPITAL.—A Staff Clinical Meeting was held at the Boston City Hospital Tuesday, May 6, 1924. 10 A. M. Free Diagnostic Cancer Clinic in all Out-Patient Departments. 10 A. M. to 12 M. Demonstration of Operative and Inoperative Cancer Cases by the Staff in the Cheever Amphitheatre. 2 to 4 P. M. Demonstration of Cancer Cases and X-Ray Treatment Technic. X-Ray Department.

MASSACHUSETTS GENERAL HOSPITAL.—A Diagnostic Cancer Clinic was held Wednesday, May 7, 1924. 2 P. M. Free diagnostic clinic—for the public, in Out Patient Department. 3 P. M. Demonstration of cases illustrating diagnosis and treatment of cancer, for physicians, in Lower Out Patient Amphitheatre. 4.30 P. M. Operation Clinic, for physicians, in Surgical Amphitheatre.

WACHUSETT MEDICAL IMPROVEMENT SOCIETY.—The regular monthly meeting was held at the Holden District Hospital Wednesday evening, May 7th. Supper was served at 7.30 P. M. The following papers were given:—

1. "Upon what shall the specialist speak when addressing a General medical audience?" (Observations on Glaucoma) Dr. George A. Moore, Palmer.
2. "The eye in syphilis," Dr. James Murphy, Palmer.
3. "The surgical importance of new growths," Dr. C. R. Abbott, Clinton.

WORCESTER DISTRICT MEDICAL SOCIETY, Worcester, Mass.—The annual meeting of the society was held at the Tatnuck Country Club Wednesday, May 14th, at 5:30 P. M.

After the business hour dinner was served following which Dr. Royal P. Watkins delivered the annual oration. Subject: "A Sketch of the History of Surgery."

ESSEX SOUTH DISTRICT MEDICAL SOCIETY.—The Essex South District Medical Society held its annual meeting in conjunction with the Lynn Medical Fraternity at the Relay House, Nahant, on May 7, 1924, with ninety-two members in attendance. Dinner was served at 6.20 P. M. After the election of the following officers for the ensuing year Dr. George B. McGrath of Boston gave an illustrated address upon "Some Problems of the Medical Examiner." A hospitality committee consisting of William T. Hopkins, chairman, O. C. Blair, Ralph E. Bicknell, Loring Goinus, J. E. Simpson, was appointed to act in conjunction with the committee of arrangements in connection with the annual meeting of the Massachusetts Medical Society to be held at the New Ocean House, Swampscott, June 6 and 7, 1924. It is urged that members able to furnish automobiles with drivers on either of these dates for the entertainment of the wives of members in attendance at the meeting will immediately send their names to the above committee.

OFFICERS ELECTED FOR 1924-25

President—Dr. J. A. Bedard, Lynn.
Vice-President—Dr. E. D. Towle, Salem.
Secretary—Dr. R. E. Stone, Beverly.
Treasurer—Dr. Andrew Nichols, 3rd, Danvers.
Librarian—Dr. C. M. Cobb, Lynn.
Commissioner of Trials—Dr. J. E. Simpson, Salem.
Council—Dr. W. T. Hopkins, Lynn; Dr. J. W. Trask, Lynn; Dr. J. F. Donaldson, Salem; Dr. W. G. Phippen, Salem; Dr. A. N. Sargent, Salem; Dr. H. K. Foster, Peabody; Dr. J. F. Jordan, Peabody; Dr. G. M. Kline, Beverly; Dr. P. P. Johnson, Beverly; Dr. F. W. Baldwin, Danvers.
Nominating Councilor—Dr. S. W. Mooring, Gloucester.
Alternate Nominating Councilor—Dr. W. T. Hopkins, Lynn.
Censors—Dr. J. F. Donaldson (Supervisor), Salem; Dr. R. E. Foss, Peabody; Dr. A. T. Hawes, Lynn; Dr. L. C. Swan, Beverly.
Executive Committee—Dr. D. S. Clark, Salem; Dr. P. W. Rowley, Gloucester; Dr. W. M. Paige, Lynn; Dr. T. H. Odeneal, Beverly.

Submitted by the Nominating Committee—Dr. H. P. Bennett, Chairman; Dr. J. A. Shatswell, Dr. G. E Tucker.

WILLIAM T. HOPKINS, *Reporter*

THE AMERICAN PHYSIOTHERAPY ASSOCIATION will hold its third annual convention at the Drake Hotel in Chicago, June 10 and 11, 1924. Anyone interested is cordially invited to attend.

PROGRAM

JUNE 10, 10 A. M.
Registration at headquarters—the Drake.
2 P. M.
Opening Address, Dr. Ray Lyman Wilbur, Stanford University, Cal.
The Curative Workship in Rehabilitation—illustrated, Dr. Fred H. Albee, New York.
Possibilities in Treatment of Cerebral Paralysis—illustrated, Dr. Shepherd Ivory Franz, Washington, D. C.
After Care of Infantile Paralysis and Orthopedic Follow up, Miss Edna L. Foley, Chicago, Ill.
Physiotherapy in Mental and Nervous Diseases, with special reference to Treated and Treater, Dr. Julian M. Wolfson, San Francisco, Cal.
The Rationale of Physiotherapy—illustrated, Dr. Frank B. Granger, Boston, Mass.
JUNE 11, 10 A. M.
Business meeting.
4 P. M.
Visit to the McIntosh Electrical Corporation, where Dr. T. C. Cornell will give several demonstrations.
7 P. M.
Dinner at the Drake Hotel.

DEATH NOTICES

DR. WILLIAM BRIMBLECOM LITTLE died April 30, 1924, at his home in Lynn. He was born in Lynn on Sept. 24, 1859, and received his medical education at the University of Vermont, where he took his M.D. in 1884. He began to practice in Lynn in 1884, on the staff of the Lynn Hospital. In 1889 he was appointed Lynn city physician and in 1901 retired, to enter private practice. He was a member of the Lynn Medical Fraternity, Massachusetts Medical Society, American Medical Association, Lynn Hospital Corporation, Clover Club and Oxford Club of Lynn. His widow, Mary F. Little, and two sisters, Mrs. Charles Greer of Lynn and Mrs. Charles Knapp of Boston, survive.

DR. GEORGE FRANCIS DODGE of Athol died at Baltimore, Md., April 28, 1924, at the age of 54. He was a graduate of Baltimore Medical College in the class of 1906, joined the Massachusetts Medical Society from Wilmington in 1907, and moved to Athol in 1915, where he had practiced since. He gave chief attention to surgery.

DR. JAMES HARRIS KNOWLES, for many years a prominent physician and surgeon in Gloucester, died suddenly from heart disease in that city, May 5,

1924. He was born in Milton, N. S., in 1860 and was a graduate of Dalhousie College, Halifax. He received his M.D. from the University of Pennsylvania in 1886, settled in Gloucester in 1887, and joined the Massachusetts Medical Society two years later. He kept his fellowship until last October. During the last few years he had occupied a summer estate at Eastern Point. He came from Philadelphia a few days before his death to put his house in readiness for the season.

Surviving him are his widow, his mother, Mrs. June Tupper Knowles of South Boston, two brothers and a sister.

DR. WILLIAM SIDNEY BOARDMAN, a fellow of the Massachusetts Medical Society, died in Boston following an operation for appendicitis, May 5, 1924.

For many years Dr. Boardman specialized in diseases of the nose and throat at the Boston Dispensary, and from 1896 to 1902 he was instructor and lecturer on laryngology at Tufts College Medical School. He was also medical inspector in the Boston public schools.

He was born in Newburyport, November 15, 1858, a son of William and Martha W. (Pierce) Boardman. He studied at Amherst, receiving his degree of A.B. in 1881 and his A.M. in 1882. He studied medicine at Harvard Medical School, being graduated in 1886, and during his last year at the school he was house officer at Carney Hospital. For many years his home was at 63 Mt. Vernon Street, and since January, 1923, when a fire compelled his removal, he had lived at 362 Commonwealth Avenue.

He was a member of the American Climatological Association, Massachusetts Medical Society, American Medical Association, New England Otological and Laryngological Society, Masonic Club and the Union Club. He was a communicant of St. Paul's Episcopal Church, Newburyport.

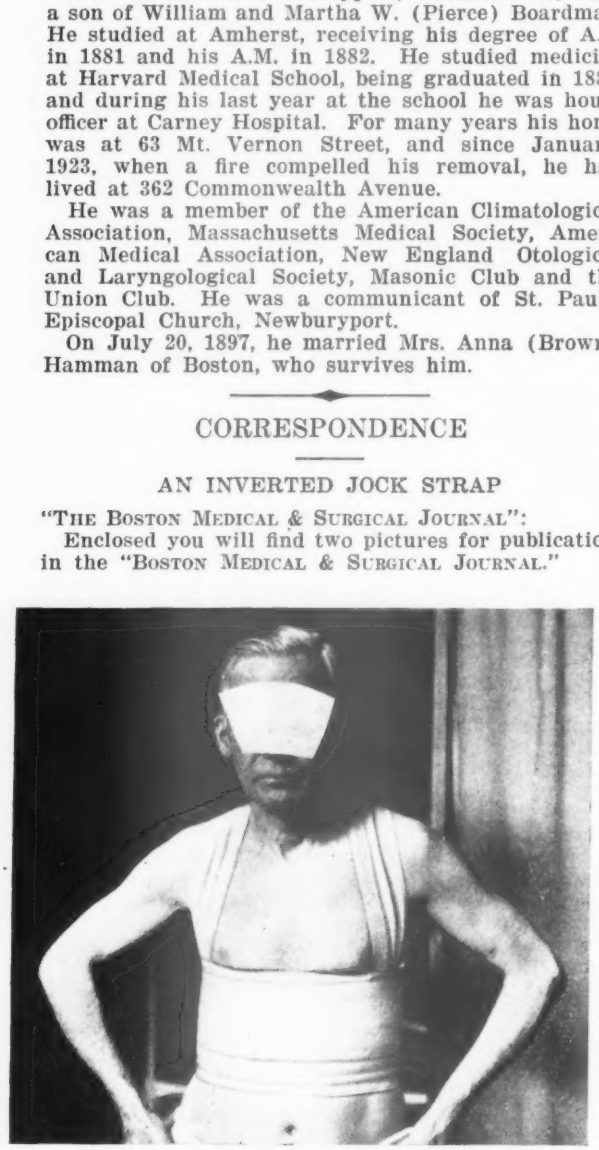
On July 20, 1897, he married Mrs. Anna (Brown) Hamman of Boston, who survives him.

CORRESPONDENCE

AN INVERTED JOCK STRAP

"THE BOSTON MEDICAL & SURGICAL JOURNAL":

Enclosed you will find two pictures for publication in the "BOSTON MEDICAL & SURGICAL JOURNAL."



These pictures are of an inverted Jock Strap, showing a front and back view. We have used the ordinary Jock Strap, inverted, in a number of cases with good results, where we have had a patient with a fracture of one or more of the lower ribs and strapping was contra indicated.

I would say that a Jock Strap inverted as we have pictured here, was indicated in those cases of fracture of the lower rib or ribs, where the use of

adhesive plaster was contra indicated, such as erythema over the affected side, where the broken fragments are driven inwards or where the fracture is in the lower part of the chest, and the pressure of the adhesive plaster irritates the diaphragm, causing hiccoughs.

Yours very truly,

J. R. KNOWLES, M. D.

First Aid Room, Old Fitchburg Station,
Boston, Mass.

CRITICISM OF A PREVIOUS EDITORIAL

April 15, 1924.

Editor BOSTON MEDICAL AND SURGICAL JOURNAL:

Dear Sir:

I have read your editorial, commenting on the pamphlet "The Shot Heard Round the World," in the JOURNAL of April 10.

I would be sorry to have the impression prevail in your mind that I gloat over the "disappointments" of the health officials in carrying out their diphtheria immunizing procedure in Concord and Bridgewater.

I should also be sorry to have you entertain the belief that my activities are prompted either solely or largely by mercenary motives. There was such a suggestion in the sentence "Its counsel is paid for putting out this sort of stuff."

I quite agree with you that it would belittle the cause I represent to "enjoy the disappointments" of our opponents. I do believe, however, that it was

entirely legitimate for this League to point out to the public the fact that such disappointments were due to the contemptuous attitude of the public health officials toward the warnings issued by this League.

You say, "If these people are logical, why not go outside of medicine and advocate the abolishment of fire departments because of technical errors?"

There is a great difference between the well-meant efforts of the Schick test advocates to immunize well children and the activities of the fire departments in attempting to put out fires already started. If the fire departments were to engage in a more or less general practice of wetting down buildings as a measure of prevention of the hypothetical possibility of fires, we should feel more at liberty to criticise any adverse results following these efforts than we should if in the course of putting out an actual fire errors were committed.

You say, "The assumption that our public health officials are not honest in their explanations is beyond ordinary decency." Perhaps I may have been too drastic in questioning the sincerity of the frozen serum hypothesis, but it is beginning to appear that the leaders in the Schick test movement are not taking that hypothesis very seriously.

In *Hygeia* for April, Dr. William H. Park, who was one of the experts employed by the State Department of Health to determine the cause of the injuries in Concord, makes the following statement:

"It happens that several other preparations of toxin-antitoxin are employed in this country and during this same cold spell a number of vials of each of these preparations were frozen and were afterward used. Fortunately there were no harmful effects whatever. These preparations have since been purposely frozen for different intervals of time and no change in toxicity has occurred. Why this special preparation should have shown this change is a riddle which may never be solved.

"An important fact in this connection is that in the preparation which is now coming into general use and is to become the standard preparation of this country, the amount of diphtheria toxin is only one-tenth of what it was in the Boston preparation."

To my mind this statement of Dr. Park pretty thoroughly disposes of the frozen serum hypothesis.

Dr. Park's statement that the preparation which is now coming into general use and is to become the standard has only one-tenth of the amount of diphtheria toxin which the Boston preparation contained, would seem to indicate either that the preparation used in Concord and Bridgewater was ten times too strong or that the preparation now coming into general use is so weak as to be unlikely to be effective. As I understand the matter, the dosage which was being used at the time of the Concord incident was itself much less toxic than the dose formerly used. Indeed the formulas used by Zingher in his early Schick testing in New York must have been pretty heroic. This extreme reduction in dosage, in itself, would be taken as an indication by most persons that the assurances given by our public health officials during the past two or three years in regard to the harmlessness of the procedure were not sufficiently well founded to be justifiable.

May I repeat that this League would have no objection to the Schick test procedure were it not that it had been promoted by methods calculated to coerce the judgment of the laity?

I have several times taken occasion to comment on your editorial of October 19, 1922, entitled "Immunity Conferred by the Schick Test," in which you said:

"The question comes to mind whether we are in a position to speak so positively about any remedial agent. Over-confidence and too strong assertions are often unwise. There are too many exceptions to the rules in medicine."

I sincerely believe that there was over-confidence on the part of our public health officials in reference to the Schick test propaganda and that the assertions they made were too strong.

Sincerely yours,
HENRY D. NUNN.

MUNICIPAL SANATORIA

There has been so much agitation of late, to compel the large cities of Essex County to take over the Middleton Sanatorium, that it seems pertinent to discuss the projected move from a medical standpoint. The projectors, in their eagerness to have the measure adopted by the legislature, seem to forget the patients' equation. To them the economic factor is paramount, the relief to the small community from the heavy financial burden entailed in the maintenance of this expensive institution, is primarily sought, and no other consideration seems to enter into the active campaign undertaken to bring about this solution of the vexed problem.

When a few years ago, the legislature enacted a compulsory municipal sanatorium law for cities of over thirty thousand inhabitants, the purpose of this law seemed to have been the segregation by hospitalization of advanced cases of pulmonary tuberculosis. The state sanatoria being intended for more promising cases, evidently something had to be done, for those unfortunates, who could not be admitted to them on account of their advanced condition, or the limited number of beds available in these institutions. The segregation of these patients seemed all the more imperative to the wise framers of this law, because the inability of the stricken ones to carry out in their homes, the precautionary measures necessary to prevent the spreading of the disease, through the contamination of their immediate Associates, seemed obvious.

These little hospitals removed then the greatest source of danger to the community, the danger of contact, of cohabitation under the same roof with healthy individuals, of sputum improperly cared for, of a careless handling of utensils, bed clothes, etc., which are recognized factors in the dissemination of the disease. That they have answered their purpose, that they have nobly carried out their humanitarian mission, no amount of slanderous attacks may disprove. They have been a boon to the community, and a blessing to the patients. They have undoubtedly been one of the greatest factors in the remarkable reduction of the last ten years in the incidence of the disease.

How many cases of *old fashioned consumption*, the type that lingers, but used to expectorate profusely in the most convenient places, have been rescued, and properly treated, and better still removed to a place of safety—safety to others! One can see them every day, fat, contented, smoking in the shacks, living on, and also profusely spitting a positive sputum! How many hemorrhagic cases, some of the fulminating type, with sometimes hardly any apparent lesion, have been rushed to these hospitals, in spite of the stern prohibition not to move these patients, because no adequate treatment could be given them at home, and skilfully handled by efficient nurses within a few minutes of the onset and saved? And now they would give them a ride of ten, fifteen, and twenty miles over impassable roads in winter. How very practical!

May we not also claim in all humility a certain proportion of arrested cases? Had these small hospitals been given half a chance, had they been less of a last resort, they would undoubtedly have made a more creditable showing. Within a few years, the prejudices against them have been abating, the people do not look upon them simply as repositories for the moribund, some patients in fair condition have been induced to go there for treatment, others demanded it for sentimental reasons, and the com-

munity awoke to the realization that they were not the last station, and that to a fair number they were stopovers on the road to health.

And then, there is the great factor, so important in chronic diseases, the *morale* of the afflicted, so much better as a rule near to the home, where they may be reached by relatives and friends in a few minutes in an emergency. The assurance that mother, sister, sweetheart, can come in every day, if they so choose, that they can themselves take an occasional walk, call on relatives and friends, have a day off on special occasions, is no small incentive to reasonable behavior and willingness to accept their fate stoically. Of course, they can do all these things in large sanatoria, but not so easily, and surely not so inexpensively.

Now, our Solons, with characteristic vision and wisdom, have practically decreed the extinction of the little hospitals! Verily, representative government *may not* be called a failure, when men elected to legislate for the welfare of the masses, can change at will a law that has been on the whole a great benefit, to have it superseded by another of doubtful expediency, and when the financial aspect of a problem completely overshadows its humanitarian appeal!

In our experience, the majority of the patients do not want a change, but that appears to be immaterial, the patients are the very raison-d'être of these institutions, why should our statesmen bother about that?

J. Armand Bedard, M. D.

THE BRISTOL NORTH DISTRICT MEDICAL SOCIETY

Editor, Boston Medical and Surgical Journal:

On Thursday, April 24, '24, the Bristol North District Society held its annual dinner. The following officers were elected for the ensuing year:

President, Wm. O. Hewitt, of Attleborough; Vice-President, Adam S. MacKnight, Attleborough; Secretary, Joseph L. Murphy, Taunton; Treasurer, Ralph D. Dean, Taunton; Commissioner of Trials, Chas. S. Holden, Attleborough; Supervising Censor, Frank A. Hubbard, Taunton.

Censors: (1) Frank A. Hubbard, Taunton; (2) Harry B. Baker, Taunton; (3) Thomas F. Clark, Taunton; (4) Arthur R. Crandell, Taunton; (5) Thomas J. Robinson, Taunton.

Councillors: (1) Frank A. Hubbard, Taunton; (2) Wm. H. Allen, Marshfield; (3) Sumner Coolidge, Middleboro.

Nominating Councillor: Frank A. Hubbard.

Alternate: Wm. H. Allen.

After a brief business meeting and lunch, the paper of the evening was read by Doctor Edward O. Otis, professor of Pulmonary Diseases at Tufts, on the Diagnosis and Treatment of Tuberculosis.

Yours sincerely,

Joseph L. Murphy,
Secretary.

NOTICES

THE SPRINGFIELD ACADEMY OF MEDICINE

The annual meeting of the Springfield Academy of Medicine was held at 137½ State Street, Tuesday evening, May 13th, at 8.30 o'clock.

Dr. Walter A. Bastedo, Professor of Therapeutics at the College of Physicians and Surgeons, Columbia University, read the paper of the evening entitled: "Practical Experiences in the Treatment of Nephritis."

Discussion was opened by Dr. George Schadt. General discussion followed.

HEALTH UNIT, 17 BLOSSOM ST., BOSTON, MASS.

The regular monthly meeting of the West End Neighborhood Conference will be held at the Health Unit, Friday, May 16, at 3:30 P. M. Mr. Horace Morison, Executive Secretary of the Boston Health League, will preside. Miss Florence H. M. Emory, Supervisor of School Nurses, Department of Public Health, Toronto, will speak on the "Activities of the Division of Public Health Nursing of the Department of Health, Toronto." Miss Emory's paper is of extreme importance, and ought to be of interest to each and every member of the Conference.

Please make every effort to attend.

Charles F. Wilinsky, *Director.*
Secretary of the West End Neighborhood Conference.

YOUNG DOCTORS WANTED

Young doctors who have had at least one year's post-graduate experience are being solicited by the Surgeon General of the Army to adopt the service as a career, according to a War Department announcement made public to-day.

The official circular authorizing examinations to be held during the week commencing Monday, July 28, gives the following regarding eligibility:

The applicant must be a male citizen of the United States, a graduate of an acceptable medical school legally authorized to confer the degree of Doctor of Medicine, must have had at least one year's hospital training subsequent to the completion of a four-year course of instruction in such medical school, or, in lieu thereof, have served one year as a medical officer of the United States Army between April 6, 1917, and July 1, 1919, and must be between the ages of 22 6/12 and 31 6/12 years at time of examination.

The necessary blank forms may be obtained at any military station, or direct from the Adjutant General of the Army, Washington, D. C. Applications from those residing in the states of New York, New Jersey, and Delaware should be mailed to Commanding Officer, Second Area, Governors Island, N. Y.

DISEASES REPORTED TO DEPARTMENT OF PUBLIC HEALTH

Week Ending May 3, 1924

Chickenpox	167	Pneumonia, lobar	140
Diphtheria	126	Scarlet fever	323
Dog-bite requiring anti-rabic treatment	3	Septic sore throat	4
		Syphilis	36
Encephalitis lethargica	2	Suppurative conjunctivitis	19
Epidemic cerebrospinal meningitis	5	Trachoma	3
		Trichinosis	1
German measles	77	Tuberculosis, pulmonary	135
Gonorrhea	85	Tuberculosis, other forms	22
Influenza	6	Typhoid fever	3
Malaria	2	Whooping cough	77
Measles	917		
Mumps	293		
Ophthalmia neonatorum	32		

SOCIETY MEETINGS

DISTRICT SOCIETIES

Franklin District:—Society meets at Greenfield the second Tuesday of March, May, July, September. Annual meeting in May.

Hampshire District Medical Society:

Meetings held bi-monthly, the second Wednesday in the month, at Boyden's Restaurant, Northampton.

STATE, INTERSTATE AND NATIONAL SOCIETIES

June 3 and 4:—American Urological Association at Ambassador Hotel, Atlantic City, N. J.

June 6 and 7:—Mass. Medical Society, Annual Meeting, New Ocean House, Swampscott.